COAL AGE

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The Men Who Stick

THE MAN who jumps from one job to another never learns enough about any particular class of work to become valuable to it. He is a jack-of-all-trades and master of none. Youth at first is in his favor, but gradually he becomes unable to give to the new work even the energy and enthusiasm of the beginner, and he finds the lowest paid and most menial classes of work beyond his ability. If you will talk with such a person you will find that he leaves a job because he has a grievance of some kind; he leaves the next for a similar reason, and so on, to the bitter and humiliating end. He fails to grasp the fact that it is not the boss or his job that is at fault, but himself.

If you have a job and are making a decent living, stick to it, or at least investigate very carefully the new work that you propose to undertake. The chances are that the new job has the same objections to it as the old one, and there is the cost, in money and time, of moving and making a new start. The experience you have gained in the old job is of no value to you unless you continue in that class of work. You have made an investment, but have "cashed in" neither the principal nor the interest.

Moreover, in nine cases out of ten, you will be back in a month or a year, pleading for reinstatement. Your request will probably be granted, but how different will be your attitude and condition. On leaving, you were an appreciated workman, in line for the best that your employer had to offer. You return a suppliant for the husks and worse than this, you find less able men who possessed the sticking habit occupying the better places which you could have had if you had held your ground. Your old companions are now above you. They have saved while you have wasted; they are independent while you are dependent; they are going forward while you are going back to begin all over again.

> MEN *may be divided into two classes—the successful and the unsuccessful. Of all the factors leading to success the disposition or ability to adopt a course and hold to it, regardless of wind or weather, is perhaps the most potent. Of all the factors which carry a man downstream, along with humanity's wreckage, is the tendency or disposition regularly to alter his course. In the end he drifts with the current into the sea of oblivion.*

The men who go forward in any business are the men who stick, studying the work in each department in which they are placed. Finally, through sheer persistency, if for no other reason, they come to know more about the business than anyone else. The rest is easy.

Miners as a class make the mistake of moving from one place to another. In doing so they lose the chance for the good working place; they lose time, money and the confidence of their employers. They develop restless habits; they become spendthrifts; they loosen home ties, they weaken the friendship and support of old neighbors. Saving nothing, they are always in debt, or as far in as they can get.

The opportunities for advancement in the mining business for well-informed miners are excellent. From a boss to a foremanship or superintendency is a step which the miner whose habits are right must surely take.

Cut the booze, begin the study of the mining game; forget about your rights and begin to worry about your duties. Quit knocking and develop the boosting habit. Stick to the job until you are master of it, and if your boss does not believe in your efficiency, stick until you prove your worth to the complete satisfaction of others as well as yourself.

Go over the industrial history of the last 25 years and you will find the truth of the results of "sticktoitiveness" exemplified in the lives of men famous in the business world. Armour stuck to beef, Hill and Harriman to railroads, Edison to electricity, Carnegie and Schwab to steel, Rockefeller to oil, Morgan to finance, and so on without end. All of these captains of industry and thousands of others that might be mentioned had the faculty of sticking to a job until they made good.

Jigging Anthracite Coal*

By E. E. Finn†

SYNOPSIS—In separating coal from slate in a jig the particles of the various materials arrange themselves on the jig bed according to their various specific gravities—heavy slate at the bottom, good coal on top. Successful results therefore depend much on the thickness of the bed of material and the care exercised in slating. Great advantage accrues from operating the slate discharge automatically.

The successful jigging of coal depends upon the difference in specific gravity of the coal and the refuse which accompanies it. Coal is lighter than slate, while bone (a poor grade of coal composed of a mixture of coal and slate) is midway between the two in weight. The specific gravities of these substances vary at different mines. The greater the difference in specific gravity between the coal and its impurities the easier may a good separation be obtained.

Referring to Fig. 1, beginning with slate, bone and coal in the jig pocket *A*, the material slides by gravity down the chute, between the dasher arms, into the jigging compartment, but back of the separation or, as commonly called, the feed gate *B*. This feed gate is set at a short distance (determined by experiment) above the perforated bronze grates *C* which form the bottom of the jigging compartment. The jig tank is full of water, and as the dasher *D*, operated by two eccentrics above, is lowered, it forces an amount of water equal to the dasher displacement up through the grates and again draws it back with the upward stroke. This pulsating motion of the water aids the material in passing under the feed gate and into the jigging compartment. However, on account of the small opening below the feed gate, only a thin layer comes through; thus making it easy for the slate, bone and coal to take their positions according to their specific gravities; that is, coal on top, bone in the center and slate on the bottom.

The three materials now advance across the jigging compartment, aided by the pitch of the grates and the pressure of the incoming feed. As the compartment becomes filled, the coal goes over the coal discharge and into the upper conveyor line. The slate or rock goes under the slate gate *E* into the bottom conveyor line, and as this line is put in motion by a clutch, the slate is discharged. The slush or fine material going through the grates is let out by the slush gate *F* at the bottom of the jig tank, and is later sized over a shaker.

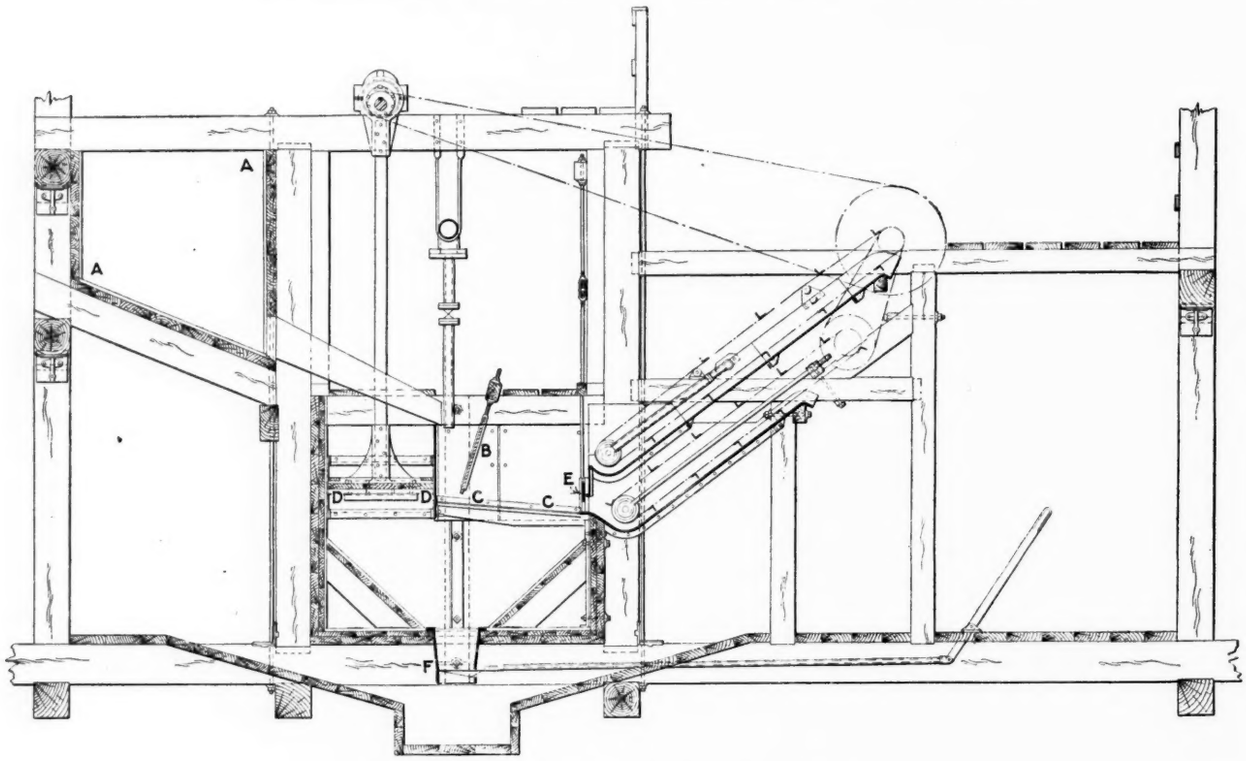


FIG. 1. TYPICAL CROSS-SECTION OF A COAL JIG

In good jigging the following precautions should be closely observed: 1. Packing strips around the edges of the dasher must be kept tight. Failure to do this means less pulsation of water and a corresponding decrease in the capacity of a jig. 2. The grates must be well secured; otherwise they move with the pulsation, thus giving the material less time in which to separate. 3. Grates must be smooth and evenly set so as not to disturb the separa-

*Paper presented before the Panther Valley Mining Institute.

†Lansford, Penn.

tion already made. 4. Liners between grates as well as grates of equal size should be placed opposite each other so as to keep the agitation balanced.

Sometimes a streak of coal appears on the slate at the discharge end. If this streak is on the top of the slate, it signifies that the coal is leaking through the coal boot or between the slate gate and the front of the jig. If the streak seems to be down through the slate, it means a hole in the grate so that the separation is disturbed. This will usually cause trouble in the coal end as well. A uniformly poor slate end means that the packing strips are too loose to give a separation or that the jig runner has pulled his slater too long.

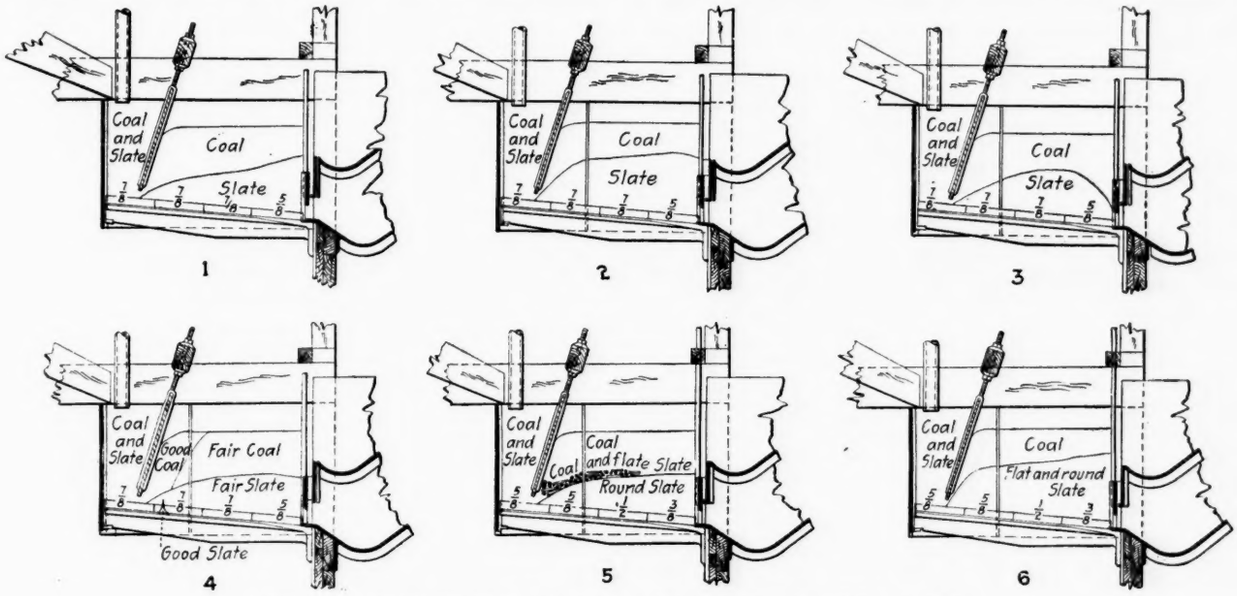


FIG. 2. ARRANGEMENT OF COAL AND SLATE ON THE JIG BED

The expression "capacity of a jig" means absolutely nothing unless accompanied by an explanation. A jig might handle 10 or 12 tons per hour at some operations and handle but 9 at other places because of a larger percentage of rock in the mine product. Rock being heavier than coal, less will be raised with the same force of water. Besides this there are other things which govern the capacity—speed of dasher, length of dasher stroke, height of feed gate, height of total bed and pitch of grates.

A change of any one of these will change the capacity, while a change of two might balance each and cause no variation. Neither is it fair to average the day's run for capacity, unless a large jig pocket is used. A uniform rate cannot be obtained, and the jig is at times running under its average. Again, the feed gate must be raised to accommodate any increased amount of material, and the jig is working unsatisfactorily.

The Results of Tests

As an example the results of a few tests on capacity are here given. The first test was made at Greenwood colliery on June 5, 1914. I made the test because the jig appeared to be handling a large amount of material. The test was on No. 5 jig, which was handling stove coal. The duration of the test (1:05 to 1:35 p.m.) was 30 min. Twelve samples were taken from material entering the jig and showed 56.9 per cent. of coal and 43.1 per cent. of slate. The coal end of the jig showed 2.4 per cent of slate during the test. The weight of the slate (with 2.3 per cent. of coal) throughout the test was 3,904.25 lb., or approximately 1.95 tons.

This weight was obtained by weighing one bag of slate and multiplying by the number of bags filled and dumped, a sample being taken from each. This showed the jig to be handling 4.51 tons of material for one-half hour, or 9.02 tons per hour.

The stroke of the dasher was 4-in. and the speed 105 r.p.m. The thickness of bed was 23 in., the height of the feed gate was 3½ in. and of the slate gate 3 in. The arrangement of grates was ¾, ¾, ⅝ and ½ in. The jig was equipped with an iron dasher.

This jig had the advantage of a forced feed, since it was at the end of a long chute, so that material was forced under the feed gate without raising it.

A similar test on an egg-coal jig at the same colliery showed a capacity of 12 tons per hour. This capacity was upheld by the average of the day's run on all egg jigs, and no cars were condemned. However, the egg from No. 11 jig was dumped with that from No. 10, and the amount of slate in the raw material was only 21 per cent. During the next morning the percentage of slate changed to 39 per cent., and every car was condemned. More jigs were then put on egg coal in order to clean it properly. The same jig runner was handling the jigs in each case, so that I credit the change of capacity to the change of slate percentage.

There is a difference of opinion in regard to the arrangement of the perforated grates forming the bottom of the jigging compartment. Some prefer a uniform bottom, while others prefer three sizes of grates—the largest in the back under the feed gate, the perforations diminishing by ⅛ in. in diameter toward the front of the jig. An example of this arrangement for chestnut coal would be two plates with ⅝-in. perforations, one ½ in. and one ⅜-in. grate each side of the center bar.

About a year ago I spent considerable time after breaker hours in the analysis of different conditions of jig beds. This was done at Hauto washery, Greenwood and Coaldale

collieries. In each case I stopped the jig under working conditions, shoveled off the coal to near the surface of the slate bed, from which point I picked off each piece by hand, so as not to disturb the slate bed surface. I then measured the height of slate bed at intervals of 6 in. from the feed gate to the front of the jig. From these tests I plotted the surfaces as shown in Fig. 2, Nos. 1 to 6 inclusive.

Nos. 1 and 2 show sections of an egg-coal jig at Hauto while handling No. 11 material. The height of the feed gate was 5½ in. and that of the slate gate 4½ in. In the first instance the jig had been running 10 min. since it had been slated. In the second it had been running 17 min. since it had been slated. No. 3, also from an egg jig at Hauto, shows the effect of running the slater too long. No. 4 shows the condition of the bed while a good slate bed was being maintained.

In each instance I found that if there were not a good separation at the feed gate then there would be none at all, which proves conclusively that the separation takes place at the feed gate and that this is where the most agitation should be. Therefore the best arrangement of grates is two with large perforations at the feed gate, the size diminishing toward the front. This gives a stronger pulsation where it is needed and leaves just enough in the front to carry the slate forward easily. Another peculiarity which I observed in this analysis of slate beds was that a thin slate bed would contain practically no flat slate except on top or mixed with the coal, while with a bed 15 in. or more in thickness (varying at different mines), the flat slate was found standing on end and mixed throughout with that of round or cubic fracture. This is shown in Nos. 3, 4, 5 and 6 and signified that if it were possible to keep the slate bed between 15 and 19 in. in thickness the flat slate, for which coal is often condemned, could be removed. However, I could not see how this could be done, as a jig runner cannot see the height of his slate.

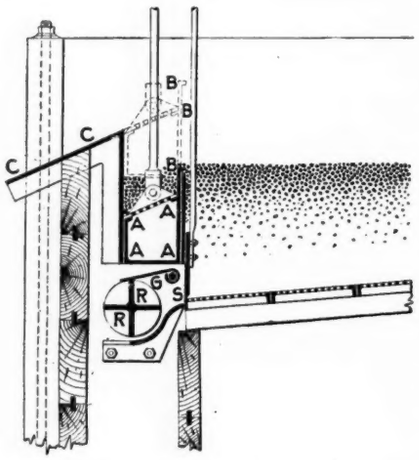


FIG. 3. AN IMPROVED JIG

An Automatic Slate Discharge

About six months after these tests were made, an overflow jig with automatic slate discharge was installed in the Panther Creek Valley. I will mention this jig later, but suffice it to say that an electric contact, which operated a rotary slate gate, was made by a copper can or float resting on the surface of the slate bed. I was enthusiastic when I learned that a similar float was to be tried on other jigs as an indicator for apprising the jig runner when his slate was high, for I saw in addition to this the possibility of keeping the slate bed at such a height as to take out the flat material, which often results in the condemnation of the jig product.

The float was tried out at No. 10 and No. 14 operations with success. When the pointer at the end of the float stem coincides with a point marked high, the jig runner starts his slater and the pointer descends until the point marked low is reached, when the slater is stopped. The first floats were frail, and others of a stronger type are now being used, No. 10 and No. 14 collieries being entirely equipped with this device at the present time.

The disadvantage of the type of jig shown in Fig. 1 is in the breakage of coal caused by the coal conveyor. To overcome this trouble a remodeled type of this jig was made, differing from the other only in its slate and coal discharge. As may be seen in Fig. 3, the latter consists of a plunger *A* operated from an adjustable eccentric. Its perforated top is inclined at an angle to suit the coefficient of friction of the coal. The coal from the jigging compartment drops onto the plunger *A*, and as this rises, the coal is held by the arm *B* until the plunger reaches its full height, when the coal slides down the chute *C* without jar or crushing.

The slate which goes under the slate gate *S* is picked up by the rotary slate gate *R* and dropped into a chute by which it is carried to the slate elevator. Above the rotary gate is the guard *G*, which is free to rise, but has sufficient weight to keep the slate from going over the rotary slate gate.

As far as I know, the Lehigh Coal and Navigation Co. is the first to do any great amount of experimenting with the jigging of rice or No. 2 buckwheat coal. Much work has been done by this firm, with considerable success.

Coal Jigging Over a Bed of Rock

Practically the first experimental work was done at Nesquehoning colliery. An overflow jig was used, but instead of employing small grates for the bottom of the jigging compartment, a bed of rock supported by large grates was used. Rock of various sizes as well as various-sized grates were tried at different times.

As the raw material came under the feed gate the slate would settle on top of the rock bed, which of course is alternately rising and falling with the motion of the dasher. As the rock rose, a slightly wider opening between the pieces allowed some No. 2 slate to settle into it, and this would be pulled down with the rock. Thus an amount of slate, depending on the thickness of rock bed, would be precipitated at each complete stroke. This slate was dropped by the rock through the grates and was taken out of the slush gate with the slush. The great advantage of this jig lay in the fact that it was practically automatic.

However, a few disadvantages were met with. Feldspar rock, which has a fracture approaching cubical, seemed to give the best results. A bed of this was made of proper thickness to suit the amount of slate in the raw material, and satisfactory results were obtained until this percentage of slate increased. If this increase lasted any length of time, the slate could not go through the rock with sufficient rapidity, and hence would go with the coal. On the other hand, if the thickness of the rock were made to suit a large percentage of slate, and a small percentage of slate came, then (since each stroke takes a certain amount) coal must go through to make up for the decreased percentage of slate.

Another disadvantage was the rapid wearing of the pieces of rock. This required frequent replacement and considerable attention.

On account of these disadvantages the work was stopped for the time being and attention turned to using the same jigs, but grates with $\frac{3}{16}$-in. perforations. This gave the jig shown in No. 6, Fig. 2, except that in place of the slate elevators the slate dropped from the front of the jig grates and into the slush tank as the slate gate was opened. Considering both the slate and coal end, the results were only slightly better than was the case with a rock bottom.

Three Disadvantages

The three disadvantages with this arrangement were irregular feed due to lack of storage pocket capacity, poor sizing due to rushes of material and inability to see the character of the slate. These three considerations are prime factors in all good jigging.

The first is the most important. Considering the hoisting of coal, its transportation within and outside of the mines and the large amount of breaker machinery other than jigs, it is easily seen that on account of trouble in any one step or process of preparation a steady or uniform feed can never be maintained for any great length of time. Therefore to accommodate a rush of material there should be storage room before the shakers, in order to get good sizing, and before the jigs, so as not to necessitate the raising of the feed gate above the best working position. If the feed gate is raised, it means that the separating layer coming under the gate is too thick to let the slate settle quickly and a poor coal and slate result.

Sizing is almost equally important, for the greater percentage of undersize in a jig goes with the slate, causing a rich slate discharge. One might say that we are at present jigging stove coal with 30 per cent. of undersize, but this 30 per cent. is in reality merely small stove-size material. It is impossible to jig two sizes of coal in one machine with any degree of success. Ability to see the quality of slate is also important, for if the jig is working properly the degree of perfection attained in the concentrates is the same as that secured in the tailings. When a colliery has a lot of coal condemned, it is reasonably certain that the slate report will show bad slate also. This is uniformly true. Hence, if a jig runner can see the slate as well as the coal, it makes him doubly confident that these machines are working properly.

The three advantages just mentioned were considered in the installation of jigs for No. 2 buckwheat at Tamaqua colliery. These jigs have elevators which raise the slate for the inspection of the jig runner, as well as making it possible to use a slate valve without the necessity of a watertight casing.

The automatic float control of slate discharge is accomplished by lowering the pawl on the ratchet which sets the rotary valve in motion and discharges the slate into the elevator. A solenoid, electrically energized, holds the pawl free of the ratchet until the float is raised by the slate bed and a contact is made. The pawl is thus released and engages the ratchet until the contact is broken by the lowering of the slate.

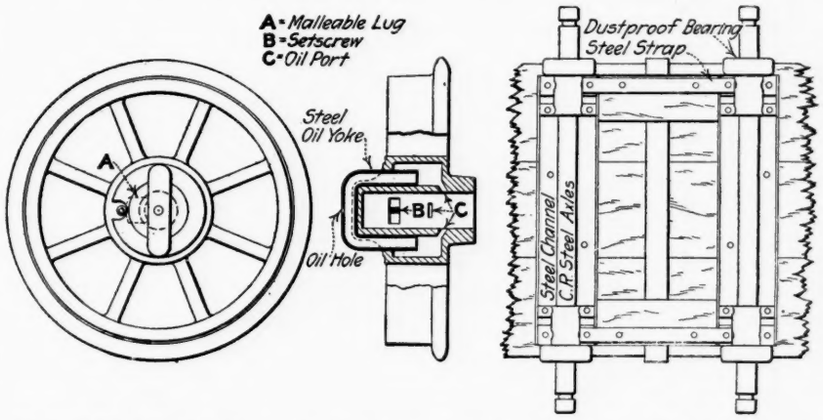
A Successful Car Wheel

About three years ago the Irwin Foundry and Mine Car Co., of Irwin, Penn., placed upon the market the Sensenich truck, which has met with a considerable degree of success. The distinctive feature of this truck is the oiling arrangement of the wheel, which embodies a large oil chamber.

The wheel is of the inclosed hub type, as may be seen in the accompanying illustration. To provide a means of oiling which will be effective in all positions of the wheel, a 1-in. steel pipe is bent into a U-form and cast into the hub. This pipe, as may be seen in the drawing, is partially embedded in the wheel hub, and when the latter is cast the wheel becomes almost wholly integral with it.

The wheel is held in place on the axle by a malleable-iron lug fitting into a groove near the end of the axle. The axles, which are of cold-rolled steel, are also free to turn in the stationary boxes.

As may be seen in the illustration, the pipe gives the central oiling feature so that the wheel may be lubricated in any position. Furthermore, there is no possibility of the oil passages becoming clogged as a result of bad cor-



DETAILS OF THE NEW IRWIN WHEEL, SHOWING OILING ARRANGEMENT

ing. If desired, the hole drilled in the pipe for the purpose of introducing the lubricant may be closed with a suitable pipe plug.

The efficiency of this oiling system has been thoroughly demonstrated in practice. It is particularly adapted to semifluid grease, and when used with this lubricant, the wheel will give long service on one lubrication and the expense of oiling will be greatly reduced, both as relates to the cost of the lubricant and also the cost of labor for its introduction.

Oklahoma Coal Mining—In an address before the Rotary Club, of McAlester, Okla., George M. Brown, mining engineer, brought out the following interesting facts regarding the mining industry in Oklahoma: Coal was first mined in the Indian Territory (now Oklahoma) about 1870 by David Mishamontutti at McAlester. The first mine was opened in 1872 and is still in operation. The largest producing mine is No. 4 at Gowen, its average production being over 800 tons a day. The deepest shaft is No. 9, at Alderson, which is 837 ft. deep. The thickest coal is 10 ft. and occurs at No. 3 Samples, at McAlester. The best-ventilated mines are at Henryetta and Lehigh. The longest slope is No. 8, at Krebs, approximately 5,100 ft. in length. The deepest workings are No. 5 mine, at Krebs, approximately 1,250 ft. The most gaseous mine is at Buck, though it has several close competitors. The largest worked-out area is at Krebs and amounts to approximately 1,325 acres.

Turnouts for Mine and Other Narrow-Gage Tracks*

By Ralph D. Brown†

The development of narrow-gage railway track is confined chiefly to limited layouts for industrial plants and to mining operations where limited clearances necessitate its use. A coal-mining company operating many mines which had been developed independently was forced by economic necessity to standardize its equipment. As some of the mines were already developed extensively, it was not considered advisable to relay the tracks entirely to change the gage, but it was found possible to use one type of frog and switch for all turnouts.

Standard designs were adopted, and the results of computations were placed in tabular form for the use of the

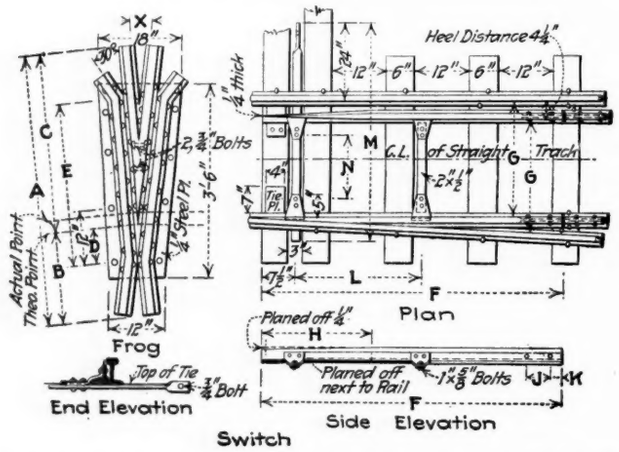


FIG. 1. STANDARD FROG AND SWITCH DESIGN FOR NARROW-GAGE MINE AND INDUSTRIAL TRACKS

construction gang. Certain assumptions had to be made, such as the length of the wing rails of the frog and the heel distance of the switch, but they were all within the limits of accepted practice and can be applied to any industrial-track system. The designs of the frog and switch point, shown in Fig. 1, were made after consider-

TABLE 1. DIMENSIONS OF STANDARD FROGS AND SWITCHES FOR NARROW-GAGE INDUSTRIAL AND MINE TRACKS

Standard Frog for Motor Turnout (Right or Left)

Frog No.	Frog Angle, X Deg.	Min.	Rail, per Yd. Lb.	Length of Frog, A Ft.	In.	Wing Rail, B In.	Heel Distance, C Ft.	In.	Length of Throat, D In.	Straight Rail, E Ft.	In.
3	18	55	30	4	0	16	2	8	3⅛	2	3
4	14	15	30	4	8	20	3	0	5⅛	2	9
4	14	15	40	4	8	20	3	0	6⅛	3	0
5	11	25	30	4	10	20	3	2	7⅛	3	0
5	11	25	40	5	0	20	3	4	8⅛	3	0

Standard Switch for Motor Turnout (Right or Left)*

Wt. of Rail, Lb. per Yd.	Length of Point, F Ft.	In.	Dist. Between Bridle Rods, L Ft.	In.	Length of Rail Planed, H Ft.	In.	Rail Punching J In.	Rail Punching K In.	Gage of Track, G In.	Length of Bridle Rod M Ft.	In.	Rod Punching, N In.
20	4	0	(1 rod)		1	4	4	2	36	5	8¼	25
25	4	0	(1 rod)		1	6	4	2	40	6	0¼	29
30	4	0	(1 rod)		1	9	4	2	42	6	2¼	31
30	6	0	2	3	2	6	4	2	44	6	4¼	33
30	7	6	3	0	3	0	4	2	48	6	8¼	37
40	6	0	2	3	2	9	5	2½	..	..	..	..
40	7	6	3	0	3	6	5	2½	..	..	..	..

* The throw of switch point is 3½ in. for all cases.

ing both simplicity and economy of construction. Any ordinary blacksmith or ironworker will make these parts without difficulty. The cost of making a No. 5 frog and two 6-ft. switch points at a well-equipped mine shop was: Material $6.37; labor of blacksmith and machinist, $6.58; total, $12.95.

A cast-steel frog supplied by manufacturers at a cost of about $6.50 is inherently more rigid than the riveted frog, but unless unusual precaution is taken it is difficult to fasten it securely to the ties. In order to stiffen the riveted structure, cast-iron fillers may be added which also support the flange of the wheels in passing over the throat of the frog, thus relieving the jar to the rolling stock.

In designing various parts of the turnouts it was kept in mind that all such turnouts may be of only temporary usefulness in one particular location and that the constituent parts may be used many times before being cast aside as useless. The standard frog is somewhat shorter than one designed to the specifications of the American Railway Engineering Association, but the saving in weight and bulk, with the consequent saving in making the several installations, will more than offset any loss due to instability.

The cost of laying and ballasting a No. 5 turnout complete, as shown in Fig. 2, was as follows:

One 30-lb. No. 5 frog and two 6-ft. points	$12.95
40 ties, 5x6-in., @ 20c	8.00
Spikes, bolts, tie-plates, etc	.75
1 low switch stand and rods	2.25
2 headblocks, 5x6-in., 8 ft. long	1.00
Total material	$24.95
Laying, 16 hr. @ 35½c	5.68
Ballasting and surfacing, 8 hr. @ 35½c	2.84
Total labor	$8.52
Total cost of material and labor	$33.47

The dimensions of the standard frogs, switches and turnouts are given in Tables 1 and 2. The formulas used for the turnouts are as follows:

$$Chord\ length\ C = \frac{G - B\sin X - F\sin Y}{\sin \frac{1}{2}(X + Y)}$$

$$Radius\ R = \frac{G - B\sin X - F\sin Y}{\cos Y - \cos X} - \tfrac{1}{2}G$$

$$Lead\ S = (R + \tfrac{1}{2}G)\ (\sin X - \sin Y) + B\cos X + F + O$$

in which

X = Frog angle;
Y = Angle of point rail;
B = Length of wing rail;
F = Length of switch rail;
O = Distance from actual to theoretical frog point;
G = Gage of track;
R = Radius of turnout.

The dimension of O was taken as 2 in. and the heel distance of switch points as 4¼ in.

The spacing of the ties depends on the size of the tie and the style of the turnouts. If the regular set of

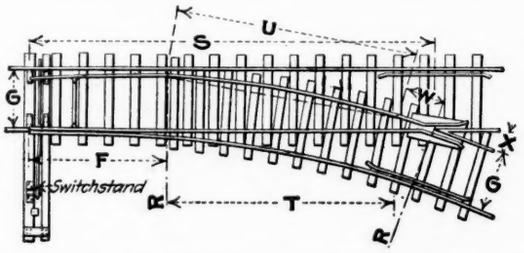


FIG. 2. STANDARD TURNOUT FOR NARROW-GAGE MINE AND INDUSTRIAL TRACKS

*Article from "Engineering News" of Feb. 3, 1916.

†Assistant general superintendent, O'Gara Coal Co., Harrisburg, Ill.

switch ties is used as in standard-gage trackwork, 5x6-in. ties spaced 18 in. c. to c. will give good results for track laid with rails weighing up to 40 lb. per yd. If the turnout is laid with ties of even length staggered in, as shown in Fig. 2, a spacing of 16 to 18 in. c. to c. for each branch has proved satisfactory. This style of construction is specially well adapted to underground turnouts, where headroom is limited and flat ties 3x5 in. or 3x6 in. are used. All switch ties should be of hardwood and treated if possible, as decay will set in before mechanical wear destroys their usefulness.

TABLE 2. DIMENSIONS FOR TURNOUTS IN NARROW-GAGE TRACKS*

Gage of Track, 36 In.

Frog No.	Length of Switch Points, F Ft.	Radius of Turnout, R Ft.	R In.	Length of Lead, S Ft.	S In.	Length of Straight Rail, T Ft.	T In.	Chord Curved Rail, U Ft.	U In.	Mid-ordinate Curved Rail, V In.
3	4	42	7 5/16	16	3 11/16	10	9 11/16	10	10 9/16	4 1/16
4	4	81	1 1/2	19	3	13	5	13	8	3 3/4
4	6	75	8 1/4	22	6	14	8	14	10 1/8	4 1/16
5	4	141	7 1/4	22	2 7/8	16	4 7/8	16	7 5/16	2 1/4
5	6	126	7	26	0 1/2	18	2 1/2	18	4 1/4	3 11/16
5	7 1/2	122	9 7/8	28	4 1/8	19	0 1/2	19	2 3/8	4 7/16
6	7 1/2	184	9 1/8	30	9 3/8	21	5 3/8	22	9	4 1/16

Gage of Track, 42 In.

3	4	52	1 13/16	18	9 1/4	12	11 1/4	13	3 1/4	4 13/16
4	4	99	2 1/4	22	3	16	5	16	8 1/2	4 1/4
4	6	92	6 3/4	25	9	17	11	18	2 1/4	5 1/8
5	4	172	0 1/2	25	9 1/4	19	11 1/4	20	2	3 1/2
5	6	153	8 3/4	29	11 1/4	22	1 1/4	22	3 1/4	4 13/16
5	7 1/2	149	1 1/4	32	5 1/2	23	1 1/2	23	4	5 7/16
6	7 1/2	223	5 1/4	36	7 1/2	27	3 1/2	27	6	5 1/16

*The table prepared by Mr. Brown includes five widths of track gage—36 in., 40-in., 42-in., 44-in. and 48-in. We give the figures for the 36-in. and 42-in. gages only.—Editor.

Too often the trackwork for mines and industrial works is poorly executed, owing to lack of experience of the tracklayers and construction foremen. The essential requirements do not differ from those of the standard gage, and true alignment and surface may be obtained by intelligent supervision.

Extracts from a Superintendent's Diary

Yesterday we celebrated a wedding in camp, the first one for several years; it is doubtful if we will have another soon, or at least not until any prospective brides or grooms now living in our midst have a chance to forget what happened to the bride and groom yesterday.

Fortunately it was a one-day affair, the ceremony, wedding journey and house-warming all taking place between sun-up and midnight. Had these events been extended over a week or more, as is often the case, it is doubtful if either the bride or groom would have survived the ordeal.

The groom is one of our boss drivers, and the bride is the daughter of one of our most popular miners. They planned to keep the entire matter secret, going so far as to rent a house in advance, in the name of the groom's father, stating that his family would arrive the following week. Even the pastor, when he was requested to go up to the bride's house, was not told that he would be expected to unite a couple for better or for worse. The groom had explained his request for a day off by stating that he had to do some shopping in the city, and the bride schemed a mission that required a trip to the city to inspect songbooks for the Sunday School choir.

Had the morning train been on time they would at least have got out of camp before any outsiders found out about the wedding, but unfortunately the train was an hour late; and during that hour they let the parson go on an errand for them, and he, poor man, let the cat out of the bag in spite of himself. Most of the camp's men were at work, but the news spread quickly to the women and children, once the secret had passed the lips of the minister, and they lost no time in assembling at the station to see that the departing couple were given a befitting send-off.

But the real spirit of the day's adventure was not born until the men inside learned of the wedding. By quitting time everyone of them had heard of it, and as they came from work, it was the sole topic of conversation. They still had about an hour for planning before the down train was due, and they used that hour to very good purpose.

When the train, with the returning bride and groom, pulled into the station, every man, woman and child was there to meet it, and in spite of the pitiful protests of the bride's mother, each was there for a purpose. The groom was taken in charge and carried to a two-wheeled cart, to which was harnessed the only vicious mule owned by the company. After being allowed to take a good look at the mule, he was bound, gagged and thrown into the cart and told to drive to his new home if he expected to get there. The mule started off at a gallop the moment he was turned loose by the crowd, and came to a halt quite as suddenly a few moments later, after having unwound two reels of telephone wire. Simultaneously, the bride was taken in charge by the ladies and promptly marched to the Sunday School room to make a report on songbooks.

About an hour later the bride and her escorts, the groom and his bodyguard, accompanied by the rest of the camp's citizens, met at the prospective home of the wedded pair and launched the house-warming. In this adventure the newlyweds were again entirely at the mercy of the merrymakers and were not allowed to get within whispering distance of each other until the celebration had been concluded. The going-out of the camp's lights was the time agreed upon in advance for the concluding of the jollification—the presentation of a handsome wedding present, a surprise to even the bride's mother.

New Colliers Building

The American Shipbuilding Co. is constructing two coal colliers at its Detroit yards of 2,100 gross tonnage each, with a speed of 9½ knots, one for Hasler Bros., Inc., and the other for Barber & Co., Inc., both to be delivered during the current year. The State Island Shipbuilding Co. is constructing two colliers of 2,200 gross tonnage each, with a speed of 12 knots, for the Clinchfield Navigation Co. Contracts for two new coal steamers have been awarded by Darrow-Mann Co. of Boston to New York Shipbuilding Co. of Camden, N. J. Each vessel will be 369 ft. long and will have capacity for 8,500 tons.

The Fatality Rate in Great Britain in the five years first recorded, between 1851 and 1855 inclusive, was 4.301 per thousand. In the last four years the average fatality rate in the same country has been 1.248 per thousand, a decrease of 71 per cent. With only two exceptions each quinquennial period has been better than the previous, and the record for the quadrennial period ending with 1914 gives promise that the 5-yearly period terminating with 1915 will make a record. In 1914 the rate was only 1.074 per thousand, for there was but one accident which could by any interpretation be regarded as large; namely, that in the Whinmoor seam of the Wharncliffe Silkstone colliery. Here 12 persons were killed and 3 injured by an explosion of firedamp.

New Thoughts on Success

By Josiah Keely*

SYNOPSIS—The author develops some original lines of thought on conditions governing success that denote an unusually keen observer of broad experience and a careful student of the subject. A number of pertinent and generally overlooked aspects of the question are touched upon and the great value of practical experience at the working face is emphasized in particular.

Everyone has his own secret ambitions and his own ideas of what constitutes success. Our preachers would have us contented with one kind of success and our captains of industry have set a pace for another. At our mining institutes, our superintendents' meetings, our casual meetings of two or three in town, in groups of men around the coal offices and among the drivers on the parting, the bulk of conversation pertains to and weaves itself around the subjects of "making good," "delivering the goods," "knocking the persimmon," "cleaning up on him," "putting one over," "skinning him" and "putting the cleaner on him," all of which slang stands for degrees of success sought and attained in mining camps.

If we could analyze our own thinking processes, it is possible that most of the mental comparisons we are daily making between ourselves and those around us are largely estimates of our own chances of success as compared with others. The frequency of the expressions "down and out," "up against it," "on the toboggan," "on his uppers," "broke" and "riding free" suggest how we are continually passing judgment on the popular conception of what success is and what it is not.

Unrest and Straining for Success

The hundreds of carefully worded applications that come into any moderate sized coal company from men in all departments of mining and from every quarter of the United States tell the story of the struggle for success better than anything else. Perhaps the coal business presents a greater number of so-called failures than any other great industry, and it might be well for us to look more carefully into the reasons.

In the first place, it will probably be agreed that no other industry is subject to such ruinous competition. Only the best survive. In order to secure the best in every department frequent changes have been made—not always changes for the better either. The willingness of some companies, often begotten of necessity, to make sweeping changes in hopes of surviving a desperate situation has encouraged men in good positions to change in order to better themselves. There has developed also the professional quack who will guarantee certain results if hired at a definite salary and who, like the fortune teller, will tell you a better fortune for a dollar than for a dime.

Then, in new fields there are always those investors who develop some poor stuff and fail, carrying down with them men who have previously been successful and who deserve a better fate. Nothing is apt to take the fight out of a man like losing his whole stake in an unsuccessful venture. Also, being connected with a concern that has gone down is not considered a good recommendation.

To meet the needs of producing cheap coal many mines have concentrated, discontinuing small operations and throwing superintendents and mine foremen out of employment. The inference is of course that had they been especially competent they would have been retained under the new organization and a place found for them.

In certain large companies the line of promotion is not definite, and men, instead of remaining, leave to accept what appears a better position or better opportunities for promotion. In any event there is an army of letter writers seeking positions, which indicates that their ideas of success lie in new fields; yet there are so few who have made any conspicuous success by changing from company to company that experience seems to favor long employments. On the whole, one company is as good a judge of merit as another, and the most favorable move toward success as indicated by promotion is where a man rises in his own company rather than changing to even a better position in another.

As to the College Man

It may not be out of place here to speak of seeming lack of success on the part of young men having taken college training or a technical course at college. It would appear that for many positions around the mines the claim to exceptional education is an actual bar, as it not only indicates lack of experience, but often lack of willingness to do the work necessary to get that experience. Many a young man has gone away sorrowfully when told that what he first needed was to go into the mines and rough it. While the boast of many of our successful coal men that they "started as trappers" is not actually necessary to a successful mining career, yet had they been unfit, they would probably have stayed in the mines; and one of the surest ways to determine ability is to start where ability is needed.

The difficulty is that those in the mines are there by necessity, and the same necessity that sends them to the mines prevents their getting the education that might bring a higher degree of success.

When there is such a demand for men who have both education and mining experience, it is a wonder that more young men out of school do not voluntarily sacrifice their desire for a "white collar" job by going into the mines and digging coal, keeping on the alert for opportunities to help the mine boss at bratticework, trackwork and timbering. All the first promotions are made from miners who are willing to "help in a pinch" and show ability. It is almost impossible for a mine foreman who has not been an actual miner to handle a mine successfully, yet any office clerk can pass the theoretical examination for a certificate.

Going into the mines means no sacrifice in money, for all office boys know that the majority of miners make more than they do themselves. It is by no means a visionary theory to advise many of these youngsters, ambitious for

*General manager, Cabin Creek Consolidated Coal Co., Kayford, W. Va.

a coal-mining career, to start digging coal. The physical training alone will be worth something. They would not have to write out an application, as miners are accepted wherever they apply. Go in with a "buddie" if you know nothing about it. After several years of inside work, if you are not found more valuable than the uneducated man of similar experience, and if you do not rise to better positions, the experiment would indicate that you are not destined to be a successful coal man.

Of course there are departments of the coal business where success may be met without this practical training, but it cannot harm anyone. However, to those who might don the cap and lamp in a spirit of exaltation and without that faith in the survival of the fittest which goes with the candidate for success, it might be well to admit that some determination is required for such a step, but application at the mines would soon test this determination.

Marks of the Successful

An apprenticeship to the positions usually considered successful in a coal-mining career should consist of a period under the same discipline that a good coal official expects to maintain. Many of the petty labor troubles arise under officers who have received promotion through other than from such apprenticeship. Hundreds fall short of success by not holding on to the humbler positions where one succeeds and by giving up to look for something better. Since in the struggle for promotion all cannot succeed, what is the difference between living out an uneventful existence on one job and making an almost certain failure by changing to others?

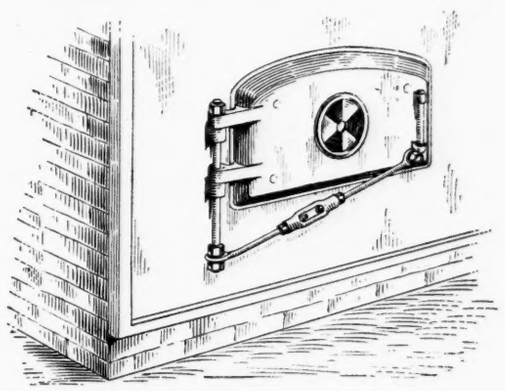
Shakespeare's villain Iago says: "Many there be, who, doting on their own obsequious bondage, wear out their time much like their master's ass, for naught but provender." The pendulum has now swung so far the other way that they seem to be wearing out their time writing applications and collecting references.

Perhaps there is no surer way to achieve a conspicuous success than to handle a mine well as a mine foreman. A thoroughly educated mine foreman who can handle a mine successfully has all the elements necessary to a great career. Some moderately well educated men are making failures at this on account of not having had the necessary apprenticeship. Many fairly good mine foremen are as high as they can go because of the lack of even a fair schooling, and it is too late now to get it. There seems to be a gap in the line of promotion at this point, which leaves that mine foreman at the top notch of an inside career, but effectually barred from the larger spheres of management. The logical line of promotion would be assistant foreman, foreman, superintendent, district superintendent, general superintendent, district manager, general manager, etc. Why would it not be logical for the college graduate or any young man with the requisite business education and office training to take the necessary inside apprenticeship instead of writing applications and asking for references certifying that he can make good at anything? Must a mine foreman continue to be the finished product of the inside organization, with nothing ahead but a possible raise in salary or a change to a better mine, or can this most important of all positions be given its place in a more definite line of promotion?

There is also another view of success which has apparently become obsolete in America, and that is the pride in the success of doing one thing well. Perhaps there are men who were never intended to be promoted; at least, there are many who account themselves failures because they have not reached the top. America's refusal to accept a mediocre success has gone a long way toward American achievement, but it has also almost eliminated the contented class. Some lay this to American women, but as they have no chance in *Coal Age* to defend themselves we will not take this position nor develop certain interesting circumstances giving rise to the accusation. However, certain it is that it need not be a bar to progress nor a stifling of legitimate ambition to choose some position requiring moderate attainments and returning a fair remuneration and there spend some extra time in the cultivation of those virtues which are rapidly being lost to those who make success and money synonymous.

Old Fire-Doors Made Usable

The repair man in a large industrial plant having a number of boilers to tend successfully uses the method of repairing the fire-doors shown in the illustration. The door is first blocked into position, and the holes in the hinges are reamed out to about 1 in. diameter with a ratchet and extension drill (an ordinary drill



DOOR SUPPORTED FROM BELOW

welded to a long shank). A new hinge pin is used which not only passes through both hinges, but extends about 9 in. below the bottom hinge, and to the lower end of this pin a turnbuckle rod is fastened by two nuts, its other end being bolted to the front end of the door just below the handle.

This makes a substantial arrangement. There is no warping from the heat, and the turnbuckle corrects any sagging of the door. The job has, moreover, a neat appearance, and it is only necessary to proportion the parts to the weight of the door to get complete satisfaction. The idea is that of Robert Fullerton, Perth Amboy, N. J., and was published in *Power*, Mar. 21.

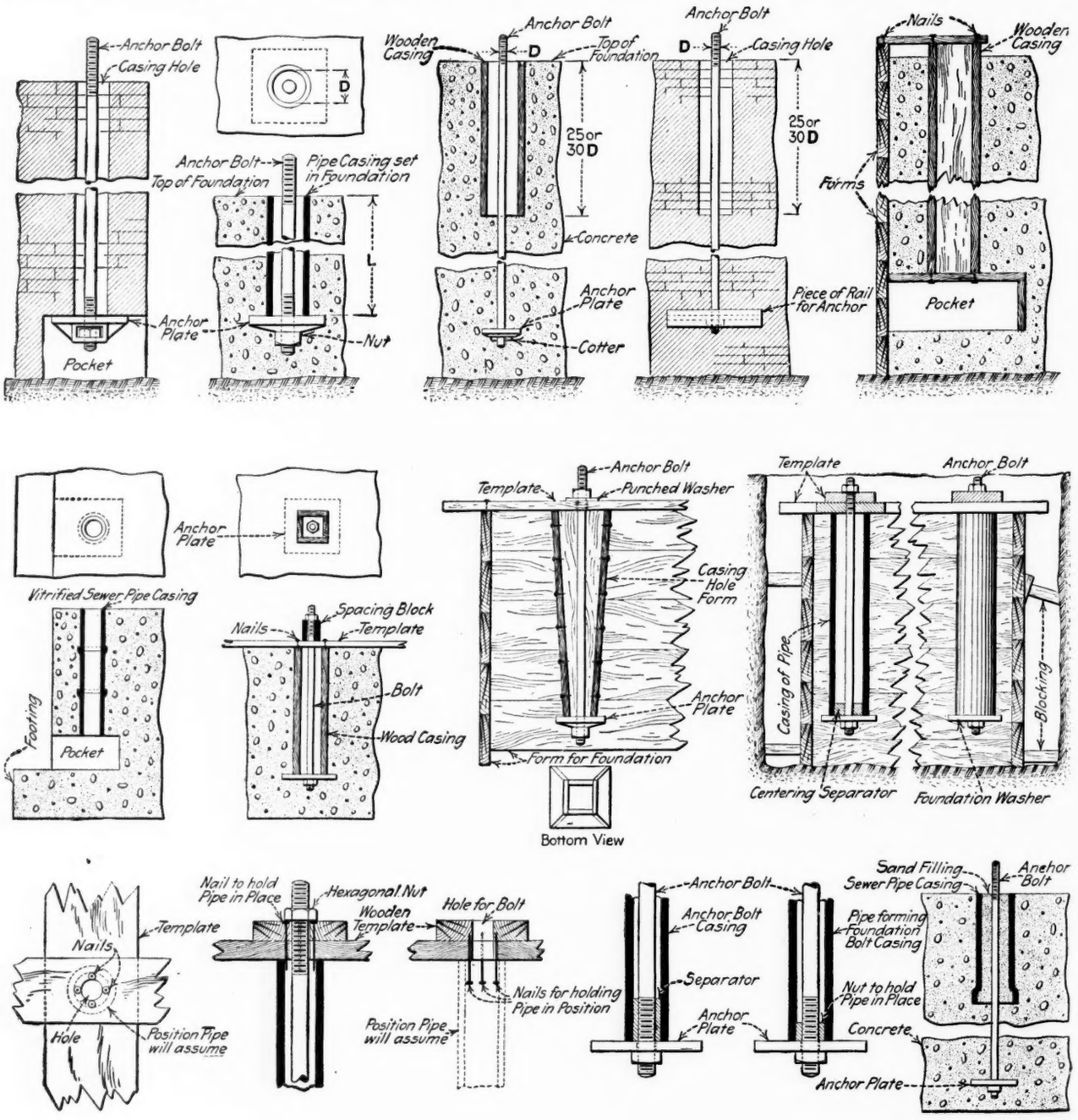
Relative Freedom of Coal Miner from Tuberculosis—"A visit to 81 coal-mining districts with a total population of 33,395 inhabitants revealed the fact from statements of coal-camp physicians that not more than 50 miners were tuberculosis victims," according to Dr. W. A. Lynott, of the United States Bureau of Mines, speaking at the Fourth Annual Safety Congress of the National Safety Council. "It is true," he adds, "you will find tuberculosis in the families of miners, but the majority of miners themselves seem to have a certain immunity."

Casings for Foundation Bolts

When placing anchor bolts in machine foundations, a casing, either of metal or wood, is located concentrically around the bolt, so that lateral movement for adjustment is afforded in all directions. This is frequently necessary because the bolts may be located inaccurately and because the holes in the bedplate of the machine, for which the foundation is constructed, are usually cored, not drilled, and inaccuracies in their location may be expected.

If either the bolt or the hole in the bedplate is out of its proper place, the play which the casing affords will make it possible to spring the head of the bolt so as to correct the inaccuracy; whereas if it were solid in the foundation—that is, if no casing were provided—it would be necessary to enlarge the hole in the bedplate to compensate for the error. Obviously it is an expensive and time-wasting procedure to ream out these holes.

The second function of a casing is to permit the removal of the anchor bolt. Where this is desirable a pocket should be provided under the anchor plate for the reception of the nut on the lower end of the bolt.



DIFFERENT TYPES OF CASINGS AND TEMPLETS FOR ANCHOR

The question of when to use casings admits of no general answer. The accompanying illustrations show various types of casings, described by Bruce Page in *Power* of Jan. 4, 1916. The problem is not as simple as it at first seems and often causes much trouble when the engineer has not prepared to meet it. The needs of almost any case will be met by some one of the types given.

Output Per Man Here and Abroad

By Samuel Dean*

SYNOPSIS—The writer shows how futile it is to hope for tonnage if a small car is used, that depth is not so incompatible with hard work as has been stated, that the British unions restrict output and that the incompetence of superintendents is the cause of much inefficiency and lack of safety in America.

A paper which I prepared and read before a meeting of the North of England Institute of Mining and Mechanical Engineers at Newcastle-upon-Tyne appears to have caused much discussion on both sides of the Atlantic. The title of the paper was, "Modern American Coal-Mining Methods, with Some Comparisons," and as all rights of publication or translation are reserved by the Federated Institute of Mining Engineers the contents cannot be published in *Coal Age* without violating certain ethical proprieties.

The paper with complete discussion makes a fair-sized volume. Many mining men of prominence joined in the discussion, including such men as Carl Scholz, W. R. Wilson, the general manager of the Crow's Nest Pass Coal Co.; James Ashworth, of Vancouver; Alfred J. Tonge, general manager of the Dominion Coal Co., Nova Scotia; E. W. Parker, Harrington Emerson and others too numerous to mention. Among those who took part in England were George Blake Walker and H. W. G. Halbaum.

Copies of the *Transactions* containing the complete "story" can doubtless be obtained from the secretary of the Institute of Mining Engineers, 39 Victoria St., Westminster, London, S. W., England.

How Discussions of Papers Are Secured

For the benefit of similar institutions in this country it may be well to describe how these world-wide discussions are engineered. The writer prepares his paper some months before the date set for the meeting at which the paper will be read and forwards the manuscript to the secretary, who immediately has it set in type. The writer having examined and corrected the proofs of his paper and illustrations, the final proofs are printed and copies are mailed to different people who are invited to join in the discussion by correspondence. They prepare their written remarks and forward them to the secretary, who reads them at the meeting after the paper has been delivered. The writer of the paper then receives printed copies of the comments and forwards his replies thereto.

The paper and complete discussion are then printed in the *Transactions* of the institute and forwarded to all the members, who are located in nearly all the coalfields of the world.

An intelligent discussion of a paper is generally most interesting, and yet we have many institute meetings in this country every year at which few debates of any importance occur. The principal reason for this is because members do not have an opportunity of familiarizing themselves with the paper beforehand; advance copies are not printed, and men who have been asked to read papers do not actually commence to write them before the night that precedes the day of the meeting. So much for our way of conducting mining institutes. Now for the production of coal.

America holds the record for total production and for production per man employed. We employ the largest railroad and mine cars in the world. And I suppose our accident rate is also a "record." We must endeavor, and I believe some of us are now trying our best, to lose this latter "championship." In the past our state mine inspectors were placed in office by the politicians; the two worked hand in hand, and there is no getting away from the fact that the high death rate in American mines is a monument to that combination.

We have the only "modern" coal-mining country in the world where mine superintendents do not have to pass a severe examination. We can open up a coal mine and put a man in charge who has never been 10 ft. underground. He, like a master mariner or a surgeon, has to direct difficult operations and has valuable lives under his charge, but the master mariner and the surgeon are compelled to pass severe and bona fide examinations. Can anyone give me a sound reason why it is not also necessary for the superintendent to pass an examination? Will any operator or mine owner describe the benefits which the industry derives from having noncertificated men in complete charge?

We have eclipsed the world in production per man, but appear to have blundered into it. We don't know the correct type and size of car to use under certain specified conditions. We can see different kinds and capacities of cars being used in seams that are the same in thickness and pitch and have similar roof conditions.

The big car is the principal cause of our high outputs. Some people claim we lead because over 50 per cent. of our bituminous coal is cut by machines. But we should still be ahead even if we did not have a single coal cutter in use in the country, though it is true that the extensive use of mechanical appliances is one of the reasons why we are so far in the lead.

Why Germany Does Not Mine as Much per Man

Carl Scholz says that we are ahead of Germany in production per man because:

1. Our seams are thicker.
2. Our beds lie level or nearly so, whereas on the Continent of Europe they pitch from 10 deg. to almost vertical.
3. Men are employed in Germany to fill the excavated area or goaf.
4. The apprentice system is in force in the latter country, but in America anyone is permitted to go to work at the coal face.
5. Greater precautions to prevent accidents lower production in Europe, and there a mine foreman is provided for every 20 or 25 miners. In the United States there is one mine foreman for every 100 or 150 miners.
6. Shooting off the solid increases output in America.

Mr. Scholz also claims that the size of cars has not much to do with the output per man and that in the

*Delagua, Colo.

longwall mines in America small cars and narrow gages are used; that in the thin seams in Missouri, Oklahoma and Michigan the tonnage per man did not much exceed that in Europe, and that it would be easier to adopt British mine cars in America than vice versa. This last remark is quite interesting; there would be ample room for those "little tubs" in American mines, but what would the result be? What could be expected if the 3-ton cars used at, say, Vesta No. 4 were discarded and half-ton cars were installed? Would the output per man be maintained? Of course there is only one answer.

But are small cars generally used in thin seams in modern mines in America? I doubt it, and I believe it can be shown that, taking seams of similar thickness and including only men employed in mining and loading and haulage work, America is ahead of any other country, and for the reason that larger mine cars are used.

Time and Effort Wasted in Using Small Cars

The following is a moving picture of a man loading 2 tons of coal in a mine where half-ton capacity cars are used: The man loads his first car and then waits until it has been removed and replaced by an empty or he removes it himself and returns with an empty. He repeats this operation four times, and each period of waiting or tramming would doubtless be of longer duration than the time required to fill the car. On the other hand, if he received a 2-ton car and loaded that in the time required to load two 10-cwt. cars, including the periods of waiting or tramming, it is at once apparent that his output would be doubled and that only half the number of men would be required at the face to produce the same quantity of coal.

A similar picture can be drawn of the whole travel from the face to the shaft bottom. When a trammer or driver takes a 10-cwt. car from the parting, he travels a certain distance to the coal face and back, returning with half a ton of coal. Had he taken a 2-ton car he would have covered the ground in the same period of time, but would have returned with 2 tons of coal. In handling the cars between the farthest inby parting and the shaft similar comparisons hold good, and the number of haulage hands could be reduced at least 50 per cent. and yet they would deal with the same quantity of coal.

S. H. Cashmore, an English colliery manager, has carefully timed the work of men loading after machines in an English mine where 10-cwt. cars were used and found that only about a fifth of the loaders' time was actually occupied in loading, nearly the whole of the remainder being spent (or wasted) in topping up, tramming or waiting for empties.

Mr. Scholz could probably imagine how many "sea tubs" and men would be required and how much time would be occupied to move the live and dead "freight" across the Atlantic in normal times if cockle boats were used instead of "Aquitanias" and "Olympics."

Where Large Cars Have Not Raised Output

It is perfectly true that larger cars can be seen in the mines of South Wales, cars having a capacity of from 2 tons to 3 tons, with track gages of 3 to 3½ ft. and rails weighing 75 lb. to the yard, having been used for over 50 years. The majority of cars in use now hold from 25 to 30 cwt., but it is difficult to induce the miners there to fill the cars to capacity.

W. L. Morgan in a letter in *Coal Age,* Dec. 25, 1915, p. 1072, said that to the best of his knowledge the union does not interfere with the miner with respect to the amount of coal he can load. If that is the extent of his "knowledge," it is evident that anything else he has to say about conditions in that coalfield cannot be of much value.

As is well known the whole tendency of the miners' union is to advise the men to reduce individual effort, so that more men may be employed to perform a given amount of work. The introduction of coal cutters and face conveyors has been retarded in South Wales because the miners insisted on and obtained terms of remuneration exceeding the advantages gained in reduced cost and increased output.

M. Stassart, of Mons, has told us that no special difficulty was met with in workings in Belgium over 1,100 m. deep, either from increased temperature or atmospheric pressure. The maximum temperatures at the working faces at 1,150 m. (3,773 ft.) were 79 deg. and 86 deg. F. These were quite bearable on account of the ventilation maintained and the dryness of the air. The production per man at the face was 4.5 long tons and the output for all men employed 0.846 tons, which was not less than the output per man in shallower seams.

Belgian Inefficiency Lies in Mine Haulage

If the output per man for all employed is less than 1 ton per shift it shows clearly that thousands of men and boys are employed in Belgium and other countries to move the small cars back and forth between the coal face and the shaft, where if larger capacity cars were used hundreds could do the work and send the same quantity of coal to the surface. The fact that larger cars are used in South Wales and the output per man is the lowest in the world shows to what an extent unionism or syndicalism has reduced efficiency.

There are a number of mines in Belgium where the workings are between 3,000 and 4,000 ft. below the surface. The seams are deeper and thinner and more gaseous than they are in South Wales, and perhaps Mr. Morgan will tell us the reason why the output per man is more in Belgium than in South Wales. William James might also give us the name of the colliery and the depth of the seam where he was unable to hold his hand on the rocks in the gob on account of the natural heat.

Men actually in charge of mines in South Wales and who took part in the discussion of the paper referred to state that to introduce improvements in that coalfield would necessitate a wholesale reorganization of the system of labor. Lloyd George, an eminent Welshman, who has turned out to be one of the strong men of his country, has also explained clearly in speeches in the House of Commons and at munition centers how "unionism" is holding back the production of munitions of war even at a time like this.

A native American who joined in this same discussion and whose remarks were quite lengthy painted life in the mining camps of his country in dreadfully drab colors. He said that the American coal miner of whatever nationality was more or less an industrial nomad. He had no settled habitation that he could call home. The lives of the majority of the camps were short. The houses or "shacks" were the property of the company.

The miner had no inducement to beautify his dwelling, because his tenure was brief and uncertain. He had spent his life in such camps and fully realized the depressing effects of their environments.

But like a great many other people he suggested nothing to improve conditions. He did not explain the political system which permitted anyone to go into the "coal-mining business" and in an effort to get rich quick allowed him to throw up a number of wooden shacks and did not restrain him from employing a butcher or baker as a superintendent of his "mine." In conclusion I would suggest:

1. That all mine superintendents be compelled to pass a Federal examination, covering the science and principles of coal mining; the planning, laying out and surveying of mines, both underground and on the surface; the ventilation of mines (illustrating this work on large maps of intricate mine workings); the sanitary arrangements of mining villages; mine safety, etc.

2. That no man be allowed to sit for such an examination unless he had had at least five years' experience underground.

3. That no man be allowed to act as general superintendent or general manager or take any part in the technical management of a mine or group of mines unless he held a mine superintendent's certificate.

4. That all coal mines be operated under a uniform national mining law.

Coal Exports After the War

The recent "peace scare" which created a mild stampede in business circles has diverted thought and study to what the ultimate effect will be when this does finally occur, as must inevitably be the case. Some interesting sidelights are thrown on this subject, as concerns our coal export trade, by an interview in the *Journal of Commerce* by R. Martens, of R. Martens & Co., a large exporting firm with headquarters in Petrograd and branches in London, Paris and Vladivostok. Lord Rhondda, better known to American coal men as D. L. Thomas, the head of the Consolidated Cambrian Co., Ltd., is president of R. Martens & Co., so that the opinions of the members of this concern are of particular interest. The chief points developed in the interview with Mr. Martens were:

The recent inquiry which his company had made in the market for 300,000 tons of American coal for shipment abroad has been withdrawn because of the scarcity of vessel tonnage and the high freight rates.

The shortage of coal in Europe is the most severe for many years.

Only those companies in Europe making abnormal profits on war-supply orders are able to meet the exorbitant figures at which American coal is held, owing to the high vessel rates.

Wherever possible, European countries are using substitutes for coal. Wood and peat are being utilized to a great extent, and Russia is consuming a large amount of oil, enormous surpluses of this being available now that exports through the Black Sea have been cut off.

During the first year after peace is concluded, Europe will require 20 million tons of American coal, pending the rehabilitation of the mining industry. The second year 10 million tons will be required, and the third, 5 million tons, after which American shipments to Europe will be down to the average preceding the war, or lower. Inability of the German Government to subsidize the Westphalian operators may eliminate that country as an important factor in the export business.

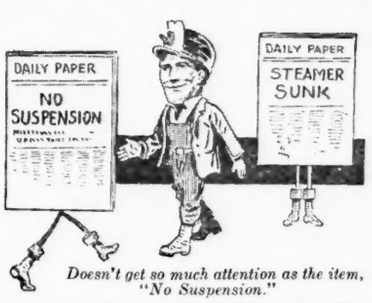
European exporters will ultimately resume their former position in the world's export markets. There will be a certain demand for American coal, but this will only grow as our general export trade develops.

Written expressly for Coal Age

NO SUSPENSION

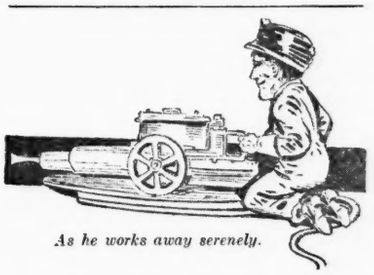
By Rufus T. Strohm

TALES of war and devastation,
Congress cutting childish capers,
Hints of peace and arbitration
Cram the columns of the papers;
But the sinking of a liner
Doesn't get as much attention
From the horny-handed miner
As the item "No Suspension."



Doesn't get so much attention as the item, "No Suspension."

Feeling conscious that the Devil
Would be diligent in calling
Idle fools to drunken revel,
Mischief, quarreling and brawling,
He recalls with satisfaction
That his fellows in convention
Paved the way to sober action
By a vote for "No Suspension."



As he works away serenely.

Raids by greaser bandits vainly
Try to set his heart a-flutter,
Since his interest is mainly
Fixed on earning bread and butter,
So his smile keeps on expanding
As he hears repeated mention
Of the happy understanding
That insures against suspension.

As with work and steady money
He can keep the wolf from prowling,
Every glance is bright and sunny
And his brow is clear of scowling.
He enjoys existence keenly,
Free from care and apprehension,
As he works away serenely,
Mighty glad for "No Suspension."

The Labor Situation

Anthracite Wage Conference

The wage conference between the miners and operators of the anthracite region still pursues its uneventful course. Last week the deliberations of the subcommittee were shortened by the fact that Saturday was Apr. 1, or Mitchell Day, when the miners celebrate the granting of the 8-hr. day in the bituminous coal regions.

The session at the Union League Club, New York City, on Thursday, Mar. 30, was short, and the discussion dealt with demand No. 9, which relates to machine-mining. An adjournment was taken early till Monday, Apr. 3, so as to give the mine workers' leaders a chance to address the miners in Wilkes-Barre and Scranton, and to give S. D. Warriner an opportunity to attend court in a suit. The anthracite region made much of Mitchell Day. Governor Brumbaugh spoke at Scranton and Wilkes-Barre on that occasion and addressed the congregations from the pulpits of some of the churches of Wilkes-Barre on Sunday.

In his speech at Scranton President White assured the miners that a raise in wages and the recognition of the union could be confidently expected, and he intimated that the 8-hr. day was a possibility of the near future.

White Asks Hard Coal Miners To Work On

Before leaving Scranton he made public the following letter which he had sent to the officers and members of local unions in districts Nos. 1, 7 and 9, which are the administrative sections into which the anthracite region is divided:

The international convention by an almost unanimous vote decided that, pending negotiations of wage scales, our membership should remain at work. The representatives of the anthracite districts are now engaged in negotiations in New York City and are doing everything in their power to prosecute vigorously the demands of the anthracite mine workers formulated in their tridistrict convention, but a settlement cannot be effected by Apr. 1.

Notices have been sent to all local unions in the anthracite districts for the men to remain at work, and I wish to emphasize the necessity of our membership complying with this order. The international and district organizations will insist upon a strict adherence to this policy. Therefore all officers and members of every branch of the organization in the anthracite districts should be governed accordingly. We are hopeful of being able to work out a satisfactory agreement at an early day.

At the meeting on Monday, Apr. 3, discussion was continued on demand No. 9, in which a readjustment of the machine-mining scale is requested. The operators' representatives continued their argument, and at the close of the meeting declared that they had completed the presentation of their case on the demand. They submitted at Monday's session additional statistics to show that the scale was in no way inequitable.

Philadelphia Joint Conference

The demands of the soft coal miners in central Pennsylvania, which have been under consideration by the operators and miners' representatives in Philadelphia since Mar. 20, have been rejected by the operators. The subscale committee is now considering a new wage agreement, which on the completion of their work they will submit to the full committee.

James Purcell, president of district No. 2 of the United Mine Workers, and the secretary, Charles O'Neil, sent out notices on Wednesday, Mar. 29, instructing the miners to continue work until further notice, following thereby the instructions of the Indianapolis convention rather than the accepted resolutions of the Dubois scale committee, which were clearly beyond the limited powers of the district.

The Indianapolis convention ordered the men to work so long as a settlement was under discussion and success was reasonably probable, but the delegates at Dubois agreed to strike if the closed shop was not granted by Apr. 1, though such an arrangement was not even demanded elsewhere. Of course such futile and unconstitutional resolutions might as well have been burned as accepted by the miners, because the international officials would not support a local demand of that kind and cannot even tolerate it, as it shows clearly in the anthracite region that "recognition" is not merely a readiness to accept any representative the miners may elect for the purpose of advocating their interest, but a willingness to compel every employee to indorse and support a certain organization whether he will or no. No wonder, then, that the local officials disregarded the action of their own convention just as the convention had disregarded the action of the Indianapolis meeting. The passing of such resolutions and even their framing show plainly that the officials do not have that firm hold on their men that they repeatedly declare they have in their conferences with the operators.

Miners' Interstate Referendum

It will be remembered that the interstate agreement is valid only if confirmed by the mine workers in a referendum. News from the upper valleys of the Hocking Valley district indicates that the wage agreement is being almost unanimously ratified by the Hocking field mine workers. Nearly all the locals with which the 8,000 miners of that field are affiliated have voted, and the scarcity of the dissenting votes is held to indicate that the Hocking miners want to work, anticipating steady operation during the coming months.

Sanford Snyder, of Athens, president of the United Mine Workers in the Hocking subdistrict, announced that the biennial joint conference of the miners and operators would be held at Logan, beginning Monday, Apr. 10. The biennial meeting of the Hocking miners began Wednesday, Apr. 5. The organization of the United Mine Workers of America in Ohio has decided to make the Hocking district the basing point of the entire state in the new two-year agreement on wage and working conditions.

Indiana Finally Ceases To Oppose Agreement

The representatives of the Indiana miners assembled at Evansville, Ind., were gradually won around to the interstate agreement, their active opposition weakening day by day, though nothing remotely resembling enthusiasm is shown for its provisions even now. Indiana is one of the areas where victory is supposed to be perching on banners; for under the new agreement has not the run-of-mine principle been provided in place of the screen basis? But Indiana rather liked the screen method of weighing and cannot be won to favor the new system. The receipt of a telegram from John P. White promising the Indiana miners that they could decide on their own methods of working somewhat mollified them. They did not want to be as careful to produce large coal as the miners are in the States of Pennsylvania and Ohio for instance. They wanted to be allowed to make fine coal to their hearts' content and to be paid the regular run-of-mine price for it. When they found they could do so without union interference they voted for the agreement 205 to 154.

Nonunion Kentucky Meets Unfriendly Critics

But they are keenly sensible to the fact that nonunion Kentucky is making all maintenance of wage hard for the Indiana operators, and they have voted unanimously to bring that part of Kentucky into the union fold.

Other parties have their eyes on these nonunion Kentucky mines. The Western Kentucky Operators' Association in conference with the miners at the Seelbach Hotel in Louisville, Ky., are asking for a 20-per cent. reduction so that they can meet the fierce competition. The miners admit the operators have a difficulty in meeting the nonunion coal in an open market, but stand firm for a 3c. rise in the price per ton and a 5-per cent. increase in the rates for deadwork and yardage.

They urge that to lower wages slightly might be a good way to increase the yearly income, provided the nonunion mines did not take the cue and make a similar reduction. The miners in the competitive field not being unionized, the union men say there is nothing to prevent the operators who employ them from lowering wages, so as to leave the union employee as little work as ever, with an undesirable decrease in tonnage rate or daily wage.

The operators urge that the miners by a reduction of 20 per cent. would assure themselves of steadier work than they obtained last year, when the mines operated only about 30 weeks. The increase the miners ask amounts to about $50,000 a year, and the miners allege that the operators are seeking a reduction of $320,000 per annum.

New Anthracite Association

Announcement was made on Mar. 29, from the office of Madeira, Hill & Co., 143 Liberty St., New York City, of the organization of the "Anthracite Coal Operators Association," composed of independent operators with an aggregate tonnage of about 13,000,000 tons per annum. A meeting of the board of governors of the organization was held on the day previous, at which many matters pertaining to the coal industry were discussed.

The association was formed on Feb. 10 of this year and includes in its membership nearly all the independent operators. The officers are: President, Percy C. Madeira; first vice-president, John Markle; second vice-president, S. B. Thorne; secretary, Alan C. Dodson; treasurer, D. B. Wentz; board of governors, J. L. Cake, W. L. Connell, E. B. Jermyn, T. D. Jones, J. L. Kemmerer, W. T. Payne and C. D. Simpson.

The objects and purposes of the association are: The conservation of coal properties by improved methods of production and distribution. The provision of the best, safest and most improved means for the mining of coal and the safeguarding of miners and other employees engaged in such pursuits. The collection and preservation for the use of its members of the laws passed in the different states of the Union pertaining to coal mining and production.

The present membership includes the following:

Mill Creek Coal Co., Hazleton, Penn.; George F. Lee Coal Co., Wilkes-Barre, Penn.; Haddock Mining Co., Miners Bank Building, Wilkes-Barre, Penn.; H. H. Smith & Co., Inc., West End Trust Building, Philadelphia, Penn.; Pine Hill Coal Co. and Wolf Creek Coal Co., 17 Battery Place, New York City; West Nanticoke Coal Co., Commercial Trust Building, Philadelphia, Penn.; E. S. Stackhouse Coal Co., Shickshinny, Penn.; Midvalley Coal Co., J. S. Wentz & Co., Upper Lehigh Coal Co. and Maryd Coal Co., Land Title Building, Philadelphia, Penn.; Buck Run Coal Co. and Darkwater Coal Co., Minersville, Penn.; G. B. Markle Co., Jeddo, Penn.; Raub Coal Co., West Pittston, Penn.; East Bear Ridge Coal Co., Scranton, Penn.; Pardee Bros. & Co., Hazleton, Penn.; Girard Mammoth Coal Co., West End Trust Building, Philadelphia, Penn.; Harwood Coal Co., Lansford, Penn.; Temple Coal Co., Sterrick Creek Colliery, Northwest Colliery, Lackawanna Coal Co., Ltd., Mt. Lookout Coal Co., Forty Fort Coal Co., S. B. Thorne, president, Whitehall Building, New York City; Sacandaga Coal Co. and Nay Aug Coal Co., Scranton, Penn.; Colonial Collieries Co., Thomas Colliery Co., Harleigh-Brookwood Coal Co. and Wilkes-Barre Colliery Co., Madeira, Hill & Co. affiliations, North American Building, Philadelphia, Penn.; Buck Ridge Coal Co., 1 Broadway, New York City; East Boston Coal Co., Kingston, Penn.; Trevorton Colliery Co., Citizens' Building, Cleveland, Ohio; Mt. Jessup Coal Co., Ltd., Moosic Mountain Coal Co., M. S. Kemmerer & Co. and Alden Coal Co., Whitney & Kemmerer affiliations, 143 Liberty St., New York City; W. R. McTurk Coal Co., Pennsylvania Building, Philadelphia, Penn.; Locust Mountain Coal Co., Dodson Coal Co. and Charles M. Dodson & Co., Weston Dodson & Co. affiliations, Bethlehem, Penn.; Excelsior Coal Co., Shamokin, Penn.; Traders Coal Co. and Jermyn & Co., Scranton, Penn.; Gorman & Campion and Port Carbon Coal Co., Stephen Girard Building, Philadelphia, Penn.; Archbald Coal Co., Wilkes-Barre, Penn.; West End Coal Co., C. D. Simpson, president, Scranton, Penn.; Emperor Coal Co., Pottsville, Penn.; Red Ash Coal Co., Wilkes-Barre, Penn.; Enterprise Coal Co. and Green Ridge Coal Co., Scranton, Penn.

The membership or entrance fee and first year's dues to the association are $5 per colliery operated or represented by the applicant for membership. The annual dues thereafter are at the rate of $5 per colliery. But further dues may be levied on the members based on the tonnage produced, the assessment being determined by the governing board, but these shall not exceed 2 mills per ton per year.

Each member will normally have but one vote, but should any member desire that another course be followed in relation to any specific vote, then the voting shall be upon a tonnage basis, each company being entitled to one vote for every 10,000 tons shipped during the preceding year as the record appears in the official report of the chief of the Department of Mines. A difficulty may be foreseen here unless the reports of the mines are published with greater promptitude than has hitherto been customary. The permissible assessments amount to $26,000 per annum, providing that it seems well to make such calls on the membership.

Anthracite Size Change Delayed

While the discussion as to the change of sizes of anthracite has somewhat subsided, there is not the least doubt that the change will be made. Owing to the many other important questions engaging the attention of the operators at this time it has been decided to postpone the innovation. It is believed, however, that the date is now fixed for a time when the labor difficulties will have been adjusted and also when the storage yards of the large companies are cleaned up on the old sizes. It is not expected that the change will be made simultaneously by all companies, as there are some who assert that they do not propose to make any change. Notwithstanding this fact, it is believed that the economic factor underlying the whole problem is such that within a year at the most the screens for sizing the coal will be changed at all breakers.

The Man Who Wins

The man who wins is an average man,
Not built on any peculiar plan,
Not blest with any peculiar luck—
Just steady and earnest and full of pluck.
When asked a question, he does not "guess,"
He knows and answers "no" or "yes";
When set a task that the rest can't do,
He buckles down till he's put it through.
Three things he's learned: That the man who tries
Finds favor in his employer's eyes;
That it pays to know more than one thing well;
That it doesn't pay all he knows to tell.
So he works and waits, till one fine day
There's a better job with bigger pay,
And the men who shirked whenever they could
Are bossed by the man whose work made good.
For the man who wins is the man who works,
Who neither labor nor trouble shirks,
Who uses his hands, his head, his eyes—
The man who wins is the man who tries.

The Man Who Fails

The man who fails is the sort of chap
Who is always looking around for a snap,
Who neglects his work to regard the clock,
Who never misses a chance to knock.
He is grouchy and slow when work begins;
When it's time to quit he jokes and grins;
He's always as busy as busy can be
When he thinks the boss is around to see.
He believes that a "pull" is the only way
By which he can ever draw bigger pay,
And he sulks and growls when he sees his plan
Upset by the "push" of another man.
He's on the job when he draws his pay—
That done, he soldiers his time away;
While the men who tackle their jobs with vim
Keep pushing and climbing ahead of him.
For the man who fails has himself to blame
If he wastes his chances and misses his aim;
He'd win if he'd use his hands and wits—
The man who fails is the man who quits.

CHARLES R. BARRETT.

Successful Car Building

The Hockensmith Wheel and Mine Car Co., of Penns Station, Penn., began making Eureka wheels in 1900. At that time the firm had a capacity of 200 wheels per day. These wheels were designed without bolts, caps or gaskets, being of the exposed linchpin type. They were also provided with an extra-heavy chilled tread and were built with a large oil chamber, a trap for preventing the escape of the oil, and a dust and waterproof valve to prevent the entrance of foreign matter such as dust, dirt and mine water.

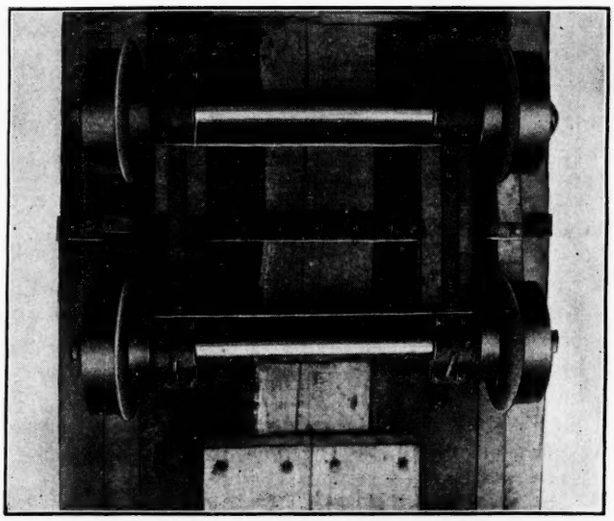
The wheels, which were straight spoked, were thoroughly annealed after casting, so that internal stresses due to shrinkage were relieved. This wheel was favorably received on the market, and because of changes in mining conditions and the constant demand for greater capacity for mine cars, the design of the wheel was improved from time to time, as well as the quality of the material used. The capacity of the plant was also periodically increased, until at the present time 800 wheels can be turned out per day.

Many of the early wheels put out by this firm are still in use, while some of this type are employed in practically every mining field in the country.

One of the improved designs of this wheel embodies a push-button valve, with a high spring tension. This allows a greater rapidity of oiling than was possible with the original design.

About five years ago a roller-bearing design was perfected in this type of wheel. This retains the original exposed linchpin simplicity and ease of removal, while affording the decreased friction incident to the employment of Hyatt roller bearings.

With the increasing length and speed of mine transportation, as well as the heavier loads hauled, the ordinary methods of attaching axles to cars became not entirely satisfactory. Accordingly this firm in 1906 perfected the design of its angle-bar truck to overcome these difficulties. This truck prevented the distortion or warping of the car bottom, held the wheels accurately to gage and maintained the length of the wheelbase. Furthermore, the axles made of cold-rolled steel were free to revolve in the stationary boxes, which is a particularly advantageous feature in rounding curves. The wheels and axles are thus of the full-floating type, and the truck while rigid so far as the framing and boxes are concerned is extremely flexible in operation. This design has fully demonstrated its ability to withstand indefinitely the shocks and rough usage unavoidable with underground mine haulage.



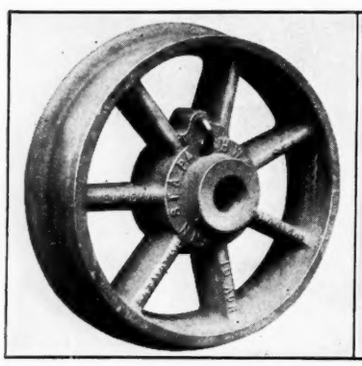
BOTTOM VIEW OF THE CAR TRUCK

This firm has been building wooden mine cars since 1875, and no doubt much of its success has been due to the reputation that it has secured for building its cars carefully and finishing its products in a thorough and workmanlike manner. About 10 years ago it began the manufacture of steel cars. These were built up in sections, either bolted or riveted together. This construction permits the rapid and easy repair of a car that has been damaged either in a wreck or otherwise and facilitates upkeep generally.

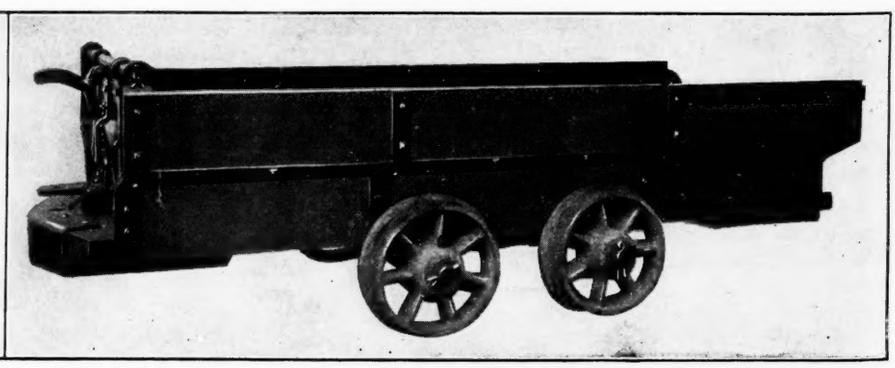
At the Panama-Pacific Exposition the Hockensmith company was awarded the gold medal for its wheel, truck and car. Needless to say this award was given by thoroughly disinterested judges and shows their conclusions concerning the excellence of this firm's products.

Coal Traffic of the Sault Ste. Marie Canals in 1915

The Government statistical report of lake commerce passing through the Sault Ste. Marie Canal for the season of 1915, which has just been issued, discloses some interesting features. For instance, the coal traffic through the canal shows a progressive decline over the past three years, which has attained to alarming proportions. The record tonnage was established in 1913, when 18,622,938 tons was moved through the canals, while in 1914 only 14,487,221 tons was moved, and 13,357,058 tons in 1915. Never before in the history of the canals has such a



AN EARLY HOCKENSMITH WHEEL



THE CAR THAT WON THE GOLD MEDAL AT THE PANAMA-PACIFIC EXPOSITION

persistent and heavy decline in the coal tonnage occurred, the nearest approach being the loss of about 1,500,000 tons in 1908, as compared with 1907.

The total movement of anthracite coal in 1915, all westbound, amounted to 2,030,730 tons, and bituminous, 11,326,328 tons. The number of American vessels passing through the canals totaled 646 and carried 66,877,411 short tons. The Canadian vessels passing through the canals totaled 806 and the short tons carried amounted to 71,290,304. For the five-year period ending 1904 there was a total of 27,285,093 short tons of coal carried through the canals, or an average of 5,457,019 tons per annum; the total for the period ending 1909 aggregated 46,491,267, or an average of 9,298,254 tons per annum, and for the period ending 1914, 76,888,356 tons of coal was passed through, or an average of 15,377,671 tons. It will thus be noted that even though the past two years have shown a rather alarming decline in the movement, a study of the tonnage over the 15-year period indicates a most satisfactory increase.

The accompanying table gives a compilation of the chief statistics concerning the coal movement, all the tonnage figures having been reduced to a uniform basis of short tons, of 2,000 lb.:

Year	Rates†	Total Value	Value per Ton Anthracite	Value per Ton Bituminous	Total Tons	Season Opened	Season Closed
1887...	90	$4,735,454	*$3.50	*$3.50	1,352,987	May 1	Dec. 2
1883...	70	7,367,644	*3.50	*3.50	2,105,041	May 7	Dec. 4
1889...	47	5,702,190	*3.50	*3.50	1,629,197	Apr. 15	Dec. 4
1890...	45	7,619,238	*3.50	*3.50	2,176,925	Apr. 20	Dec. 3
1891...	43	8,776,362	*3.50	*3.50	2,507,532	Apr. 27	Dec. 7
1892...	41	10,164,931	*3.50	*3.50	2,904,266	Apr. 18	Dec. 6
1893...	40	10,528,420	*3.50	*3.50	3,008,120	May 1	Dec. 5
1894...	40	8,191,917	*2.93	*2.93	2,797,184	Apr. 17	Dec. 6
1895...	37	6,993,351	4.25	2.40	2,574,362	Apr. 25	Dec. 11
1896...	32	8,452,073	4.75	2.50	3,023,340	Apr. 21	Dec. 8
1897...	30	9,456,824	5.50	2.60	3,039,172	Apr. 21	Dec. 14
1898...	35	10,334,461	4.75	2.40	3,776,450	Apr. 11	Dec. 14
1899...	46	12,854,278	5.70	2.60	3,940,887	Apr. 26	Dec. 20
1900...	44	14,620,840	5.25	3.00	4,486,977	Apr. 19	Dec. 16
1901...	38	15,492,226	5.60	2.90	4,593,136	Apr. 20	Dec. 21
1902...	45	16,570,398	6.25	3.25	4,812,478	Apr. 1	Dec. 20
1903...	53	24,898,407	5.80	3.15	6,937,633	Apr. 2	Dec. 15
1904...	40	19,657,221	5.50	2.60	6,454,869	Apr. 30	Dec. 26
1905...	33	20,706,302	5.60	2.75	6,509,056	Apr. 10	Dec. 20
1906...	35	25,136,044	5.75	2.50	8,739,630	Apr. 13	Dec. 22
1907...	31	34,461,584	5.80	2.60	11,400,095	Apr. 22	Dec. 15
1908...	30	28,868,837	5.47	2.50	9,902,460	Apr. 21	Dec. 15
1909...	31	29,044.855	5.47	2.50	9,940,026	Apr. 20	Dec. 16
1910...	31	41,392,801	5.30	2.75	13,513,727	Apr. 12	Dec. 15
1911...	31	48,552,057	5.85	2.75	15,332,876	Apr. 22	Dec. 16
1912...	30	49,303,871	6.00	2.85	14,931,594	Apr. 24	Dec. 19
1913...	30	58,927,341	5.85	2.70	18,622,938	Apr. 14	Dec. 18
1914...	30	46,173,087	5.85	2.70	14,487,221	Apr. 20	Dec. 17
1915...	30	42,359,320	5.80	2.70	13,357,058	Apr. 13	Dec. 20

* Average price of anthracite and bituminous coal combined. † In cents per short ton.

Industrial Preparedness

At the sixth annual banquet of the Westinghouse interests in the Pittsburgh district, held under the auspices of the Westinghouse Club, on Saturday evening, Mar. 11, at the Fort Pitt Hotel, the principal speaker was William L. Saunders, vice-chairman of the Naval Consulting Board and chairman of the board of directors of the Ingersoll Rand Co., of New York.

Mr. Saunders had chosen for his subject, "Industrial Preparedness for Peace and War," and in the course of his remarks said that if the industrial strength of the United States became known, no foreign country would dare attack us. We are the largest and richest of all industrial nations. This is generally admitted. The last census (1912) showed the wealth of the United States as being about 188,000 million dollars. Today it is probably 200,000 million dollars. The consumption of coal in the United States is 5 tons per capita—a larger coal consumption than that of any other nation. The per capita coal consumption of the great industrial nations England and Germany is 4 tons, while that of France is 1.6 tons, and Russia with its millions of population only ¼ of a ton.

This means that our industrial wealth is enormous, and it is industrial wealth which offers the greatest protection to a nation in time of war. It is obvious that this industrial wealth cannot be utilized in full measure unless it is organized, and it is obvious also that it takes a long time to organize a country as big as the United States; hence the importance of beginning now to place our industries in a position where they will respond quickly and fully to the needs of the Government in case of trouble.

This is a subject that should particularly interest Pittsburgh, because it is one of our largest industrial cities. Being situated back from the exposed coast, Pittsburgh would naturally occupy a place of great importance in time of trouble. The President of the United States has asked the five leading engineering societies—namely, Civil, Mining, Mechanical, Electrical and Chemical—to organize the industries of the country.

A plan has been formulated by the Naval Consulting Board involving a directorate of engineers in each of the 48 states of the Union—this directorate to consist of five men, one from each of the societies mentioned. These men have been selected by their respective societies and will have the aid of all other engineers in the States in tabulating and correlating our industrial resources.

Where a Telephone Installation Increased the Output

A novel and rather unusual example of success in increasing the productive capacity of a mine was attained at a Kentucky operation through the installation of a telephone system. The mine had produced between 800 and 900 tons per day for a number of years, when the extension of the working places made it desirable to effect a change in the main haulage roads. The change was practical in every respect, and besides cutting down the length of haul by several hundred feet, it eliminated the necessity of keeping up several thousand feet of roadway, most of which required timbering.

It was thought by all the company officials that the change would result in a larger output, and there was considerable surprise when it was found that the productive capacity of the mine fell off to between 500 and 600 tons. Drastic measures were resorted to in the endeavor to close up the leak, in the course of which both the mine foreman and haulage foreman were discharged. At about this time I was transferred from another operation of the company to this mine. In view of the reports I had heard concerning the loss in productive capacity I had expected to find the mine very badly run down, but the reverse proved true. The mine was clean and uptodate in every respect, with the rooms well drained, the trolley wires well hung and a plentiful supply of power.

When hoisting was started I made the rounds of the sidetracks and found that all the drivers were waiting from 30 to 40 minutes for each trip of empties. I took this up with the foreman, and we corrected the trouble by cutting off one driver on each sidetrack; but matters were still unsatisfactory, so we instituted an investigation of the main haulage motors. After a very careful study

of this problem we found that the three motors were interfering with each other in such a manner that one and sometimes two of them were continually waiting for a connection between each other or the third motor, and in the event of any one of them being wrecked, the whole mine would be tied up.

A consultation of the mine officials was held, and it was decided to install a complete telephone system throughout the motor haulage roads so that each motorman could receive instructions at all sidetracks. The system was installed with the utmost dispatch, and so perfect was the control over the haulage that lost time was practically eliminated, and the output of the mine jumped up to between 1,000 and 1,200 tons per day.

The system has now been in operation for about three years with practically no accidents of any kind. Some difficulties in the upkeep have been encountered, the boxes collecting moisture and the batteries being difficult to keep up. The trouble of the moisture was overcome by putting an electric light bulb in each box, and better insulation for the wires has been obtained by hanging them from the coal instead of on the timbers, as was originally done.

Robindale Mine Explosion

An explosion occurred at the Robindale mine of the Conemaugh Smokeless Coal Co., Seward, Indiana County, Penn., on the morning of Mar. 30, eight men losing their lives. Perhaps only one other explosion in Pennsylvania has developed such force, that being the Naomi disaster at Braznell, Fayette County, Penn.

The dead, all of whom were married, are: John Waddell, superintendent; H. H. Yocum, mine electrician; Thomas Hoover, cageman; George Matson, motorman, and four Italian miners. There is a possibility that two more men were in the workings at the time of the explosion. The interior of the mine was completely wrecked, and heavy steel beams that were used in the overcasts were bent and twisted. The tipple at the mouth of the mine was wrecked, and the fan was put out of commission.

Usually thirty men are employed in the mine, but a strike had been declared the day before. It was first reported that the "strikers" had dynamited the mine, but the mine officials are not of that belief. The mine is practically newly opened and is reached by a shaft opening about 250 ft. deep. Four Italian miners went into the mine to get their tools, intending to work elsewhere owing to the strike, and their open lights undoubtedly set off a body of gas. It will never be known if the men had the permission of Superintendent Waddell to go into the mine, which was not inspected for gas that morning; but it does appear that they had permission, for it was practically impossible for them to get into the mine without passing Mr. Waddell and the three men who were killed with him, as the latter were making some repairs near the foot of the shaft.

Immediately after the explosion, Mine Inspectors T. D. Williams and Nicholas Evans, of Johnstown, with first-aid men from the Cambria Steel Co.'s rescue force, were on the scene. Shortly after the accident, James E. Roderick, chief of the Department of Mines, with Mine Inspectors Joseph Knapper, Joseph Williams and C. D. Crocker, also arrived from Pittsburgh, where they had been attending a meeting of the mine inspectors. The quick arrival of Mr. Roderick and his inspectors on the scene was made possible by the Pennsylvania Railroad Co., which ordered one of its limited trains to stop at Seward.

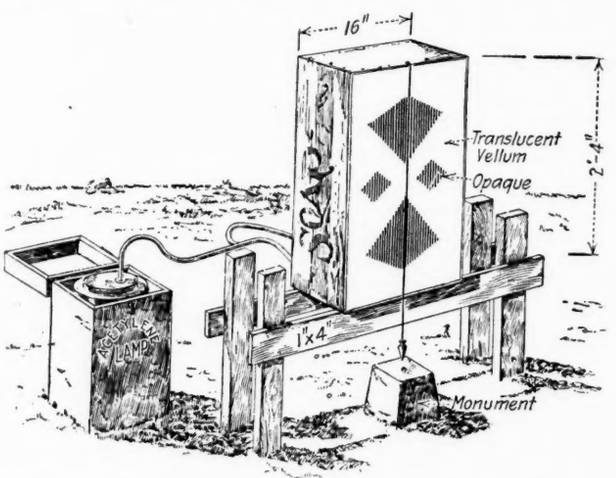
The mine started to fill with water during the early afternoon, thus delaying the rescue work, but after awhile the pumps were started and the danger was removed of the workers' being electrocuted by the falling of an electric wire into the water.

The seven bodies recovered were burned almost beyond recognition. The five mine inspectors on the ground entered the mine repeatedly to search for the body of Thomas Hoover, but they were unable to find any trace of it, and it is believed to be buried under the débris. The men on strike were among the first to tender their services for rescue work.

An Improved Target for Use in Determining Azimuth

The illustration shows a target for determining azimuth which was employed in a topographical survey of Fort Sill Military Reservation in Oklahoma. It is described in "Professional Memoirs" by Lieut. D. H. Connolly, Corps of Engineers, as follows:

The only devices worthy of mention in the survey were the targets. Two kinds were tried. One was the usual book method of letting the light shine through a hole in a piece of tin, making the hole of such size that the mark



ILLUMINATED TARGET FOR AZIMUTHAL OBSERVATIONS

looked about the same size as the star. The target that gave better results is shown by the sketch. This one was plumbed over the copper plug in the monument. In sighting on the mark the opaque design on the target was bisected by the cross-hairs of the theodolite.

This target was better than the hole in the tin, because it made a large flare, which helped in picking up the mark quickly. As time is an important element in this kind of observation, and the base line made a large angle with the meridian (about 80 deg.), this ease in picking up the mark was a big advantage. The target was illuminated with two burners attached to one of the small acetylene lamps furnished to engineer troops for use in the drafting tent. One or two more burners would have been better, as two did not light it so brilliantly that the cross-hairs stood out distinctly against it.

Editorials

The Miner and Preparedness

With almost a single voice the mine workers have declared themselves against preparedness. Yet it is probable that very few there are who would be indifferent if war were forced on us and their help was needed. The miner is by no means indifferent to the honor of the flag and the needs of his country.

Unfortunately such sacrifice as he is willing to make when the country is attacked will avail him nothing. As a nation without means of protection can make no efficient resistance, perhaps it is better for it to be conciliatory when caught unprepared. But given time to prepare for resistance, it is mere cowardice and parsimony to leave a nation without arms and to run the risk of a foreign occupation.

The miner is of all persons the least likely to submit peacefully to the crushing heel of a foreign despotism, and he is likely to be one to suffer most heavily from such an untoward change in our national status. But he has so fully absorbed the teaching which declares that there is no danger, and he has been so completely misled by the misstatements in our school histories that it is hard to arouse him to the national peril.

At the first cry of danger to the republic there would be a generous response from the miners, but without guns or training they could do little but dig trenches—for the enemy. As in Great Britain, the pick of the men could volunteer—the men who valued home and country and knew what defeat meant; and the rest would stay at the mines and make trouble, the union leaders being utterly unable to control them after the reasonable and patriotic men had left.

There is a certain percentage of men in every mining community who call themselves socialists, but believe wholly in seeking their own personal advantage and have no real interest in the advancement of society in general. Socialism is too ideal to succeed, but strange to say among its adherents are many who have no ideal other than their own personal profit. It is these men who will be left when the call to arms has taken away the better men; and their selfishness will succeed in disgracing labor, for there will be no one to vote to work when they declare for a strike.

The natural segregation of the discontented will take place here as in Great Britain and will make much trouble. It is true, of course, that the South Wales miners were partly justified in their agitation so long as the operators were making unlimited profits. It is to be hoped now that prices have been fixed the miners will realize that their duty does not permit striking or agitation, though there has been a strong disposition to find an occasion for a strike despite all that such a disagreement would portend to the nation.

Preparedness is certainly coming, whether the miners favor it or not; and every mine official ought to prepare himself by acquiring some knowledge of war conditions and service, as the engineers in all the cities are now doing. Even better yet, he can combat the spirit which declares that the nation which is defenseless can do most for justice and international law. It is as if a man were to say that property would be safer and people could be happier if we did away with the police.

Federal Fatality Statistics

Hitherto our fatality statistics, federal and other, have been too vague and have not enabled us to tell just under what conditions an accident occurred. The manner of their collection, through the mine inspectors of the various states, has hindered the federal authorities in their endeavor to get the necessary information. The duties of inspectors were reasonably felt to be to reduce the number of fatalities rather than to record them, and the former duty loaded them all somewhat heavily.

Inspectors are the hardest of working men. In the past there were one or two careless inspectors who would come to a mine and write a report on information supplied by the operator or one of his employees. But this is no longer true, and the recent departmental ruling in Pennsylvania, which requires the inspectors figuratively to "punch the clock," is not justified by any slackness on their part, but only by the clamor of people who are probably less prompt in fulfilling their duties than the diligent men they have ignorantly criticized.

And because inspectors have been busy men, they have never standardized their reports and have never given consideration to their value in the compilation of a detailed classification. The federal bureau has succeeded in arranging for this service to the public, and it is therefore to be supposed that the inspectors as individuals have undertaken to furnish the information. Yet there is much more needed, and it is to be hoped it will follow. We still desire to know what parts of the body are affected by accidents, and it is presumed that this information will soon be obtained.

Meanwhile it is pleasing to note the activity displayed by Albert H. Fay, of the Bureau of Mines, in placing our mine statistics on a sound basis, and it is a plain duty to bespeak for him the hearty coöperation of all in an industry the officials in which are already somewhat grievously overburdened. If it had not been for the lack of leisure, the information would probably have been available in our state reports long ago.

Diagnosis by First-Aid Men

The article of Fred B. Kilmer in our issue of Mar. 11 may easily be misapprehended if not read with care. He condemns the teaching to first-aid students of the diagnosis of disease, but he does not disapprove, at least openly, of instruction on the diagnosis of injury.

As a matter of fact the first-aid man always diagnoses the injury after a manner. It is therefore useless to condemn the attempt to train him to make such a diagnosis. Years ago first aid was reprobated, but the

answer made to the objectors was unassailable. This answer ran somewhat after this manner: "First aid is as old as man. Whenever a man is hurt, someone will be there to do something for him, right or wrong. The study of first aid assures the victim that he will be helped and not injured by the assistance rendered."

So also with diagnosis. The first-aid man skilled or unskilled is going to make out "what is wrong" with the victim. He is going to assume that certain parts are whole and certain parts broken. But unless we teach the trained men to make careful inquiry and to exercise discretion these assumptions will be largely wrong.

To assume that a man has not a broken arm when he has may result in the turning of a simple fracture into one that is compound or in the severance of an artery, or it may merely result in wasting time over some minor operation such as the splinting of the wrist when the whole arm needs attention. Again such lack of care may cause the patient untold suffering and may give him a shock from which he will with difficulty recover. This is only an illustration and one might with profit elaborate on such mistakes at much greater length.

Serious mistakes are probably often made in first-aid work from a lack of care in diagnosis, though of course no one hears about it. The victim's wounds receive attention eventually, and the doctor is unable to tell the injuries that were natural from those which resulted from inefficient first handling.

The first-aid men when working at a problem are told that this and that are the injuries sustained, but when a man is found groaning below ground there is no little slip of paper to tell the rescuemen just what ails him. He may be able to throw the necessary light on his injuries and to diagnose the case himself, but the first-aid man must frequently draw his own conclusions; and he will be a wise man if he takes no chances, but bandages and stiffens a somewhat larger part of the victim's body than the infallible indications show are in need of attention. It is well to oversplint than to undersplint a patient, and it is better to be safe than to be sorry.

Entrance Age to "Mule Heaven"

The British, as shown under the title "Mortality of Draft Animals in Great Britain," on p. 568 of the last issue, keep a record of the life of their horses and ponies at work in their mines, and from it most interesting information can be obtained. The percentages have been calculated for the benefit of our readers, and it only remains to draw interesting deductions.

The rate of death, natural and by order, is nearly twice as high for accidents as for disease. American mules probably would show an ever larger proportion of deaths from accident, as their health is excellent and their treatment is probably not so good.

It is interesting to note that only 54, or 0.077 per cent., were allowed to die of old age. The percentage would probably be far larger in America, where pasturage is cheap and where it is customary to keep the veterans of the haulage roads till death overtakes them.

But the most interesting thing about the whole record is that the total death rate is only 6.92 per cent. Supposing the animals are never removed from the mine to the farm, as is often the custom in America, the active life of a horse or pony would be 14.5 years. If the animal was 3 years old when initiated to the mine workings, the average entrance age to "animal heaven" would be about 17.5 years, which is quite a respectable duration of life.

It must be remembered, however, that the record is for a selected period between 3 years of age and death and not between the birth and decease of the animal, and therefore if the living conditions are normal the figures of average life should show a better result than is obtained among the same animals where their whole death rate from early foalhood is taken into consideration. It is the "expectation of life" above the age of 3 years which is considered. To that is added the 3-year period, and calculations of this character always give a higher result than the same expectation from the day of birth.

It is questionable whether an equally favorable record could be shown on this side of the Atlantic, where the mule too often gets treatment which is not kindly and where he does not get enough care and consideration when he is sick.

The British figures seem to show that even the mines in Great Britain are healthy places, despite their greater depth and higher temperature. Putting the statistics on a base similar to those in use in respect to men, the fatality rate is 21.7 per thousand, or rather 42.6 per thousand, including deaths inflicted by order after an accident. If with this drawback animals live in the mines till they are 17.5 years old, their existence underground cannot be unhealthful. However, we must not forget the possibility of change of occupation, which is the statistician's perpetual nightmare.

Somehow there is a haunting sense that there is something wrong when the mines kill 21.7 animals in a year and there are only 1.1 fatalities among miners in the same period. The relative proportion is probably no better here, and the rate gives us a fair matter for careful thought. The figure 21.7 is used, and not 42.6, because the accidents to the 20.9 per cent. of animals killed by order after injury were probably for the most part such as would end in the case of men merely as serious accidents and not as fatalities.

Uncertainties in the New England Market

The demand is good for the smokeless coals at New England distributing points for delivery inland. On such business $3 is named as the base price, plus $2.25 for freight and discharge, making $5.25 the average close price on cars to Providence or Boston. A number of consumers are being forced into the market through the expiration of old contracts, and others are obliged to buy because of embargoes against all-rail deliveries. On the other hand, the factors who have free coal are not inclined to sell except for prompt shipment. Practically no prices are now being made for delivery through the season. The poor condition of the railroads is going to throw a large additional tonnage on the tidewater points, and when the effect on marine freights is considered there are reasons for the apprehension that is beginning to be widespread. Those who were looking ahead so eagerly to Apr. 1 find the situation getting more complicated as time goes on.

Sociological Department

Frick Welfare Brotherhood

The local institute movement has been mainly started from without, or at least as a welfare project organized by some department head. The Frick Welfare Brotherhood had no such origin. It "just grew," and the seed was a certain gay float prepared for an industrial parade. The constructors of the float, during intervals in their labors, discovered that they had a common aim—to learn more about mining—and they decided to form an organization to promote that end.

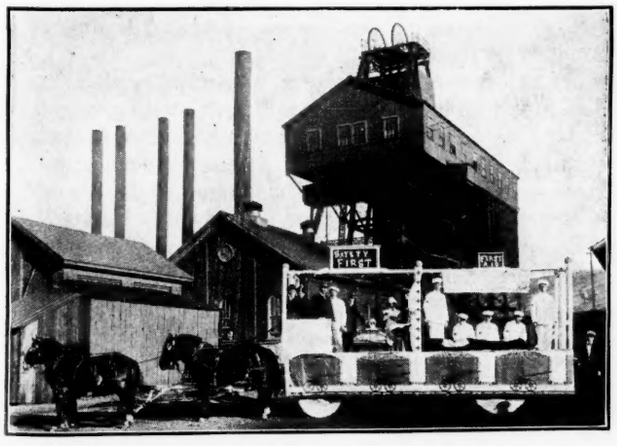
It was a more than ordinarily ambitious float which started the movement, as the illustration herewith clearly shows. As the parade was to be held at night it was necessary to light it up brilliantly, and the district electrician of the H. C. Frick Coke Co., having a 1-hp. direct-current motor in stock, decided to use it as a motor, driving it by a motorcycle engine. Thus he was able to supply current for several 5-watt 10-volt lamps, which were placed in series.

The power generated was enough to supply current for 100 such lamps, yet it was possible to conceal the "plant" behind canvas on the front end of the float. With such brilliant illumination the coal wagons painted on the cotton drill showed up with remarkable distinctness. The safety-first and first-aid signs were painted on glass, and their lighting was easily arranged. Several additional lights were added for general illumination purposes.

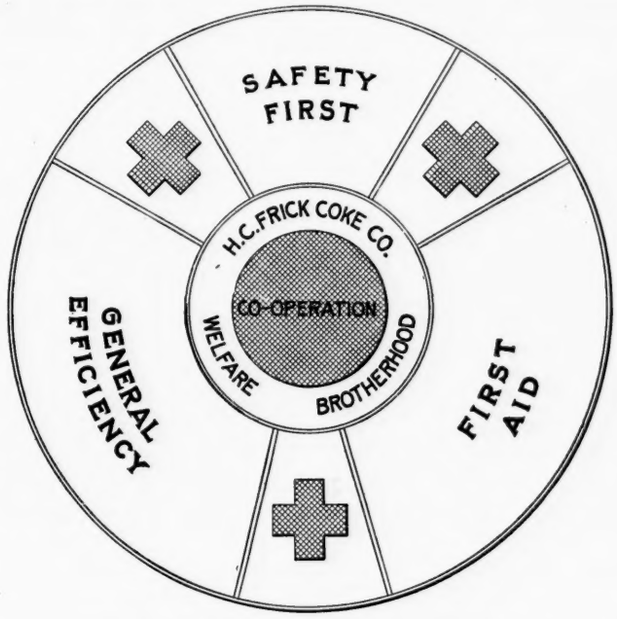
As can be seen, the front end of the float illustrates an emergency hospital with a patient, nurse and doctor; the rear end was occupied by a first-aid team, which bandaged the patient during the parade.

As a result of the care taken in the construction, the float took first prize at the festival; but better yet, as stated, it formed the Frick Welfare Brotherhood, which meets monthly and has as its motto: "Safety First, General Efficiency, First Aid and Coöperation."

At the monthly gatherings, lectures are given by prominent coal men. As a rule there is a question box, and if any question is broached which is too difficult for immediate reply, someone is appointed to obtain the information before the next meeting. The officials of the H. C. Frick Coke Co. are of course giving the movement every encouragement, but the institute has its origin in and its main support from those who occupy no official position. The badge of the brotherhood has been painted on a glass screen set in a frame of mission type. This is lighted from the interior and keeps the "brothers" in mind of their perpetual obligations.



PRIZE-WINNING FLOAT PASSING SOUTHWEST NO. 1 MINE OF H. C. FRICK COKE CO.



EMBLEM OF THE FRICK BROTHERHOOD

The officers elected for the first six months of the year were M. O. Hopwood, president; C. J. Spence, vice president; T. M. Polanofsky, secretary; J. T. Fornwalt, treasurer; J. L. Berg and Charles McGoogan, auditors.

At the opening meeting of the year addresses were made by W. H. Glasgow, assistant general superintendent, C. L. Albright, Boyd Glasgow and George Smithley.

Jellico Mine-Rescue Station

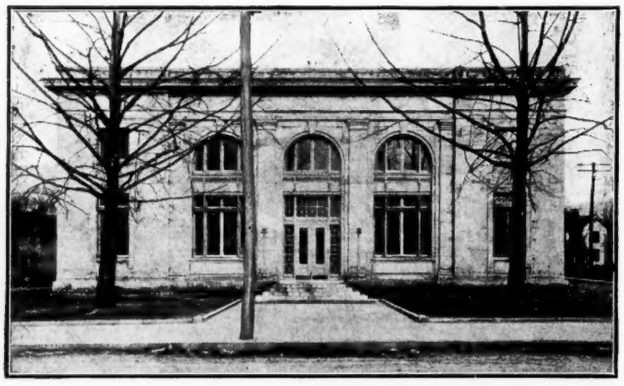
The illustration on page 642 shows not a bank, a public library or a city bathhouse, but a mine-rescue station and post office combined, at Jellico, Tenn. It is the kind of building which is commonly called "a piece of governmental pork" or "a plum" if not erected in New York, Washington, D. C., or a few like large cities, because it has been quite generally thought that, outside of communities like these, fine buildings should not be erected by the government.

But the logic of such arguments is, to say the least, weak. The only objection to the adopted method of making appropriations is that it is not based on population, but on chance or bargaining. Every town is

entitled to a Federal building commensurate with the number of its citizens, and it is a bright idea to combine a public work like mine rescue with the delivery of mail by building a common home which will house them both.

The efforts of Richard Wilson Austin, who is the representative of the second district of Tennessee, are reflected in this building. The inscription on the frieze reads, "Post Office and Mine-Rescue Station." It gives much satisfaction to the mining men at Jellico. They feel it is an official recognition of their industry and of their efforts to promote first-aid and rescue work.

The building costs about $80,000 and measures 50x70 ft. The entire second floor is given over to the work of the Bureau of Mines, and the accommodation is the best that has hitherto been given to this organization at any point. There are office rooms, a lecture hall, a smoke room, bathrooms, toilets and locker rooms, all heated by hot air and illuminated by inverted lights. Electrical connections are provided for the motion-picture machine,



COMBINED FEDERAL RESCUE STATION AND POST OFFICE, JELLICO, TENN.

and an exhaust fan is installed for clearing the air of the smoke room after tests have been made.

Philip Francis, superintendent of the Proctor Coal Co., is secretary and treasurer of the local mine-rescue organization, of which Louis Francis, mining engineer, is captain, assisted by Thomas Francis, electrical engineer, Vincent Thaler, Walter Lewis, Hickman Smith and John Reed.

Community Nurse Brightens a West Virginia Town

Social welfare work is being carried on by the Federal Coal and Coke Co. at its colliery at Grant Town, W. Va. The work is under the direction of Miss Beatrice K. G. Flynn, of Boston, and has been going on since June, 1915.

In addition to her welfare work Miss Flynn assumes the duties of district nurse for the coal company, and her ministrations to the families of the miners in times of sickness have tended to make her the most popular woman in the community.

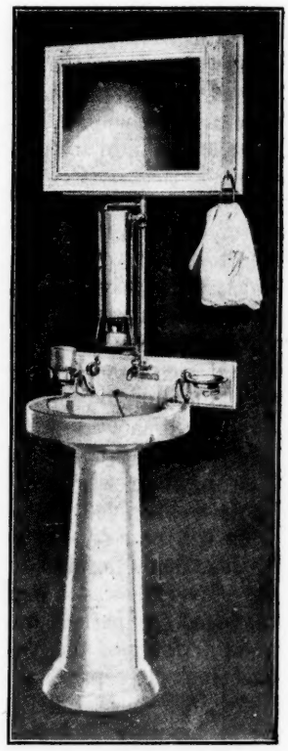
A modest settlement house has been provided, where the girls of the community are taught to cook and sew and learn the arts of housekeeping. A children's playground has been established, where various forms of amusement are at the disposal of the children and grown-ups as well.

Creature Comforts in Camp

Perhaps too many of us have made up our minds that a mining camp is a place into which no creature comforts can ever enter because we have no sewer system and in most cases there is no running water in the houses. However, a scheme has been devised by which the outhouses can be replaced by a closet in the house, without providing sewer connections.

The fitting consists of an outer casing and seat below which is placed a large pail which is made of noncorrodible material. Half full this pail weighs 25 lb., and it is said that it needs to be emptied only every three or four weeks.

To keep it sweet it is covered by a mixture of one part of chemical fluid to two parts of water. But this provision, while apparently calculated to keep the contents innocuous, is further aided by a thorough ventilation of the stool, four small holes being made in the bottom of the casing and a 3-in. sheet-steel pipe being attached near the top.



THE ROWE SANITARY WASHSTAND

By connecting this with the chimney a draft is obtained which should make this closet, it would seem, less objectionable than are, during use, the ordinary unventilated fixtures such as are supplied for the residences of even the wealthy. Those who have investigated the action of ventilated closets, such as a few office buildings are now privileged to possess, will readily recognize the possibility that this contrivance will have some advantages even over the porcelain stool with sewer connections. The 3-in. pipe can be put through specially cut holes in the house chimney or can be enlarged with a "reducer" so as to fit into a regular 6-in. flue hole or can be run through the roof and be satisfactorily ventilated solely by means of a strong natural draft.

The same company makes a washstand with a hand-filled tank which holds 4½ gal. of water with a receptacle for used water in the base. Those who prefer it can also add the hot-water heater, shown in the illustration, which burns denatured or other alcohol and heats the water in one to three minutes. The equipment, with its clean white enamel finish, its mirror and polished nickelwork, should make it attractive. Put in the mine foremen and superintendents' houses, these fixtures would be given a fair test, and if found as attractive as they appear might be installed in all the better houses in a mining camp wherever they would be appreciated and where care would be taken of them. The manufacturer of these fixtures is the Rowe Sanitary Manufacturing Co., of Detroit, Mich.

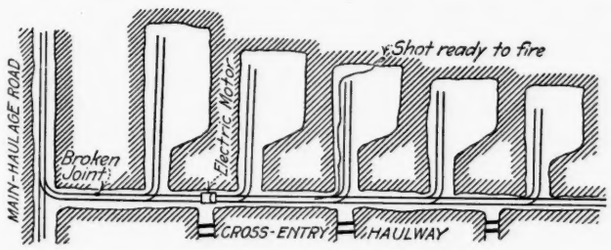
Discussion by Readers

Accident in Electric Blasting

Letter No. 6—I have been much interested in the discussion of possible accidents in electric blasting and have recently performed a simple experiment for my own satisfaction. I thought that the results obtained would be of interest to the readers of *Coal Age* and that possibly their publication would be the means of saving a life that might otherwise be sacrificed through no lack of care on the part of the person, but because our knowledge of conditions in this respect is incomplete.

In thinking the matter over, I wondered if a shot could be exploded prematurely by the accidental contact of a bare firing cable with the rails of the track on which a motor was being operated, provided there was a broken joint somewhere between the motor and the shaft bottom. To satisfy myself on this point I performed the following simple experiment:

I prepared a shot, and having connected up the battery cable to the fuse wires, I laid the bare end of the cable



SHOT FIRED BY ELECTRIC MOTOR

across the track on which a gathering motor was being operated. There was a broken joint in this track outby from the motor. As a result, when the controller of the motor was opened, the shot was fired by the current that passed through the motor, the rail and the firing cable.

This experiment seems to be sufficient proof in my mind that a prepared shot might thus be fired accidentally under conditions similar to those I have described. I have drawn a rough sketch to illustrate this point. If my conclusion is correct, a shot prepared at the face of any one of the rooms shown in the figure could be fired prematurely by reason of the bare firing cable being in contact with one of the rails of the track while the gathering motor was at work in that section, provided there was a broken joint at some point outby in this track. I would like to hear from others in regard to this point, as in my opinion it is an important one.

Lochgelly, W. Va. THOMAS H. WILDING.

Letter No. 7—I have followed the interesting discussion concerning accidents in electric blasting, started by the inquiry of James T. Reynolds, *Coal Age,* Jan. 29, p. 221, but have failed to see any reasonable explanation of one point, mention of which has been made in Letter No. 4, Mar. 18, p. 507, and Letter No. 5, Mar. 25, p. 546. The writer of each letter draws attention to the fact that the first and last holes of a number of shots connected in series may be exploded, while the middle shot will not be fired.

During an experience as shotfirer in one of the bituminous mines of Pennsylvania, in which I fired 620 shots, I had only three misfires. About 95 per cent. of all the shots were fired in the coal, while the remainder were used to break rock. In this work I used No. 6 electric blasting caps with 6-ft. iron wires and a small battery consisting of two dry cells, which I described in a previous article, *Coal Age,* Vol 7, p. 255. On two separate occasions I attempted to fire two small charges at the same time, my general practice being to fire only a single shot at a time. On each of the occasions to which I refer, the detonators were connected in series, and in both instances but one charge was exploded, leaving the other intact. In each case, after reasonable delay the second charge was connected to the battery, with the result that when the circuit was closed the shots were fired successfully.

Resistance of Bridge Wires in Detonators

My explanation of the failure to fire both shots in these two instances was that there was a difference in the resistance of the bridge wires of the two caps. To explain, suppose the bridge wire of one of the caps had a greater electric resistance than that in the other cap. It seems reasonable to believe that the cap whose bridge wire offers the greater resistance will be more quickly heated to a temperature necessary to explode the fulminate than the wire having the lesser resistance, and the resulting explosion of the first cap would then break the circuit and prevent the explosion of the second cap, provided of course that the battery used is one of small capacity, as was the case in this instance.

The three misfires in a total of the 620 shots mentioned above bears witness to the efficiency reached in the manufacture of electric detonators. In order to avoid possible accidents, the three caps that misfired were placed on the rail and run over by a haulage motor, with the result that two of these, though crushed flat, failed to explode, which would indicate that they were not loaded with fulminate. The other cap exploded under the wheels of the motor, suggesting that the bridge wire in this cap was either missing or broken, or that the iron lead wires were short-circuited.

Permit me to suggest that the very feature that recommends the use of electric blasting in place of firing by fuse or squib is frequently the direct cause of accidents. That feature is the confidence the shotfirer has that he possesses a better control over the firing of shots. Absorbed with the thought that he can cause the explosion at any moment he may desire, he forgets other important things and is often foolhardy enough to use a lead wire that is too short to enable him to reach a point of safety.

He is apt to forget, also, to give the necessary warning to other persons in the vicinity. My experience is that miners are prone to seek a hiding place that, while

out of range of the shot, is too near for safety, and I have been obliged many times to warn them to go to a safer distance. At other times I have found men standing against a rib under a loose piece of slate that might be jarred down by the force of the blast.

To make electric blasting reasonably certain, it is necessary to take the precaution to use fresh explosives and test all detonators. It is of the utmost importance to employ persons for this work who are thoroughly acquainted with the use of explosives. In order to make shotfirers constantly alert to danger and willing to use only the safest methods in their work, they should be questioned periodically and necessary instructions given them. All shotfirers should be in possession of and familiar with the several publications relating to their work that are issued from time to time by the Federal Bureau of Mines.

M. D. COOPER.

Elsworth, Penn.

Sealing Off a Mine Fire

Letter No. 1—Being a more recent subscriber to *Coal Age,* I did not get the benefit of the 32 letters that discussed this important subject some time ago, referred to in Ostel Bullock's inquiry, *Coal Age,* Feb. 19, p. 349, and which are said to have expressed a wide range of opinion. I believe that our experience in sealing off two mine fires similar to the one described by Mr. Bullock will be of interest at this time.

The first fire occurred about 10 ft. inside of the last or open crosscut at the head of a pair of entries, while the second fire occurred 45 ft. inside of such an open crosscut. Both of these fires were handled in the same way and with practically the same results, except that there was but a single explosion following the erection of the stoppings at the second fire instead of a series of smaller explosions that occurred when the first fire was sealed off. Although the single explosion at the second fire was more violent than any of those that occurred in the first fire, neither of them was strong enough to damage the work done on the stoppings.

First Stopping Placed on Intake

The first fire occurred about six weeks ago near the head of the fifth-south off the main-east entry. In company with six or seven well-trained and experienced fire fighters, I reached the scene to find that the fire had gained considerable headway and that the dense smoke had backed up 150 ft. against the air current on the intake, while the return airway appeared like a milky stream of dangerous smoke.

Since there were two rooms with open crosscuts inby of the point we had reached on the intake, it became necessary to push forward and gain a point inside of the last room, where we proposed to build the first stopping. Any attempt to increase the ventilation for this purpose seemed to make the matter worse, and the scheme was adopted of nailing a sheet of canvas to a piece of 2x4-in. tracking, which was then held by two men above their heads while they advanced slowly up the entry, pushing the smoke before them.

By this means it was possible to reach a point just inside of the last room, where the canvas was nailed in position so as to completely close the entry, although a little smoke continued to come over the top of the curtain. While two men proceeded to erect a frame for a permanent stopping, two others started to open the crosscut just outby from this point, so as to short-circuit the air current and permit it to pass into the return airway. About the time the first stopping was completed on the intake, this crosscut between the entries was opened.

Second Stopping Built on Return Airway

Work was now started on the return air by stretching a curtain from the outby rib of this crosscut forward to within 2 ft. of the inby corner, which forced the air passing through the crosscut against the smoke in the return current. It was a difficult task, now, to push the curtain forward, gaining a foot at a time across the return airway. But having at last successfully accomplished this, the curtain was advanced slowly, as before, up the return airway to a point about opposite the stopping erected on the intake, where it was set in position so as to close the return airway at that point.

Although dense smoke continued to come over the top of this curtain, it proved a great check and enabled the men to build a permanent stopping outside of the curtain. When this was done, a second like stopping was built about 3 ft. outside of the first, and the space between filled with fireclay rammed as tightly as possible.

Explosions Followed the Building of the Second Stopping

I may say that after the curtains had been placed across the entries, as I have described, slight explosions occurred on the inside every 10 or 15 minutes. Orders had been given forbidding any shooting within 1,000 ft. of these stoppings so as to prevent their being injured by the concussion of the air due to blasting. Five weeks later the stoppings were opened. It was found that the fire had been smothered completely. Nothing then remained to be done but to turn the ventilation again into the entries and clear out the volume of gas that had accumulated behind the stoppings.

The second fire occurred about a week ago, and as I have said was treated in the same manner. This fire is still bratticed off and will remain so for a sufficient time to put it out. Permit me to say that, in my opinion, had we placed the first stopping on the return airway, the fire would have driven us out of the mine and we would have been obliged to seal off the tops of the shafts.

Carlisle, Ind. JOSEPH MEAKIN.

Success in First-Aid Work

Letter No. 3—As a student and a captain of a first-aid team, I wish to discuss the benefits derived from this work by men who spend time in gaining a knowledge of the duties of a first-aid man.

I do not know whether the writer of the article that appeared in *Coal Age,* Mar. 11, p. 465, is a medical man or not, although his address is the same as that of a firm that sends out a great many first-aid supplies to the mines of the country. The view presented by this writer is that of some instructing physicians, who hold that the less knowledge a first-aid man has the better it will be both for him and for the men he will treat. The doctors of a certain class wish to keep secret many points that would be of great help to first-aiders. They seem to desire to cloak their instructions in mystery.

We cannot all be doctors, nor do we wish to be. We do, however, crave the knowledge that will help us to locate with unerring accuracy the bleeding artery of some poor fellow who may be bleeding to death. I cannot give my unreserved approval to any course of first-aid work that would not supplement the spoken word with charts and books explaining the necessary steps to aid the injured. We need more graphic illustrations of how to rescue and treat our workfellows injured by accident. Illustrations should be prepared so plain and graphic that a "greenhorn" mine worker could grasp their meaning and be able to give the needed aid, instead of running in panic to the shaft bottom when his "buddy" was caught by a fall. With a better knowledge he could stay and render the aid needed to keep the unfortunate man reasonably safe until help could reach him.

We find the boys have not the same interest in their work with triangular bandages that they had with rollers. The appearance is lacking for exhibition work when the former bandages are used. Triangulars if made of standard length and properly stored are really the best for nearly every kind of injury, although they do not work as well as rollers in injuries of the fingers and also some injuries to the face and head.

The Mine Hospital a Much Needed Haven

I am surprised that anyone could find fault with the maintenance of colliery hospitals. Where will the first-aid team put a man on a cold winter's day when he has been brought from the mine, which is fairly warm, and is suffering from shock and needing warmth more now than ever, if not in the warm hospitals provided at the head of the shaft for just such cases as this? The underground hospital; crude as it may be, is a very fine haven for a fellow who has been led perhaps a mile from his working place, blind from the effects of the quick and merciless gas. He needs absolute protection from the air and needs the treatment for shock which the trained first-aid man must give him.

Instead of being afraid that through a little knowledge a first-aider might injure his fellow worker, would it not be better to impress again and again upon our minds the results of infection, the pain of mishandling a simple fracture and the need of extension and rigid splinting in all cases of this kind? Would we ever allow a tight bandage to cause a victim pain and perhaps gangrene if we knew that such results would follow? We need, not less instruction, but more, in order that we may deliver our fellows to the surgeon so treated that they will have a better chance because of the lessened danger of infection and be able to get away from the hospital and be back again at work in a less number of days.

Suppose that for a stated period the cases from our mines were closely noted and the results of the actual work done were tabulated, and the winning first-aid team proclaimed upon this basis. I wonder if the contest winners would then be the winners in the actual number of recovered cases.

No! We need the mine hospitals and the fuller knowledge that comes from a closer study of the work of giving ease to our stricken fellows. The doctors and nurses are doing their work well where they are. What we want to know and know well is how to do the first quick work of the battle with infection and death, so that the men when they come into the hands of the surgeon will have will come to the surgeon with a good chance.

The state ought to take interest in the fellows who train themselves in this line of work. A test should be provided that could be taken by all first-aid men, which if they are able to pass would entitle them to a badge that would mark them, when traveling or in search of pleasure, so that if anything occurred they would be known and would be available for service in the relief of the stricken one. For in the broadest sense this whole work rests on and is founded on that deep sense of charity for the needy which found its fullest expression in the life of Him who blessed the giving of a cup of cold water to a needy one.

J. Kenvin.

Maryd, Penn.

Efficiency re Financial Success

Letter No. 1—In reading the article "Efficiency vs. Making Money," *Coal Age,* Feb. 26, p. 366, it occurred to me that there is often a great deal of romance associated with the idea of efficiency.

In my opinion the efficient man is the practical man—one who is able to judge work or to size up a job and who knows how to organize his forces so as to get the maximum of work performed by a minimum number of men, while maintaining a standard of normal working conditions.

Company efficiency begins with individual or personal efficiency. Personal efficiency depends on two chief factors, common to every individual; namely, time supply and life, or energy, supply. There is, however, in addition to these a personal equation that is different in each individual, and in the last analysis efficiency must therefore depend on a study of personality.

Because of the difference in personality, individual efficiency is not a matter of standards or methods alone, since these must vary with the individual. What may be a short-cut or easy method for one will often prove a long and difficult task for another.

Elements in Securing Practical Efficiency

Thus in the great struggle for practical efficiency in all matters in which the individual is concerned, there is required a wise judgment of human nature and individual capacity. The efficient man in any action is the one who stands between profit and loss and whose judgment of persons and affairs is such as to bring results; in other words, the man who can produce the goods.

The idea of industrial efficiency is mainly based on the profits realized in the production of coal, steel or any other commodity. There has been considerable contention as to whom these profits belong—whether, as claimed by the socialist, they are the earnings of the toiler or, as seems more rational and right, they are the reward of good management and the legitimate income of invested capital. But without entering into this argument it may be said that invested capital and efficient management contribute a much-needed service to society and benefit the toiler by providing him the daily wage that is his sustenance and the income from his investment of time and labor.

In comparing industrial plants producing like commodities, we find some that are operated at no profit, while others, owing to better management and greater efficiency, realize profit in proportion to the effectiveness of their methods. A little reflection makes clear to the

unprejudiced mind that, while there may be a profit-sharing plan in plants where the efficiency of the workers and their coöperation have been made factors to increase the general efficiency of the plant and decrease the cost of production, such a plan must be carefully worked out on an equitable basis.

In closing, permit me to cite a case that comes to mind of an operator who, when considering the application of a man for the position of foreman, showed him the plan of the mine and told him to go underground and examine the workings. On his return from the mine the operator said that he would appoint him foreman only on the condition that there should be no increase in the operating expenses of the mine, except as warranted by an increased output of coal. The man at once accepted the terms and made good.

That mine today has nearly doubled its output as the result of changes made by the foreman which were better suited to the condition of the workings. The incident illustrates what I said previously that the efficient man is the man who can produce results—the man whose intelligence enables him to adopt methods and train his men in a manner to produce a maximum output at a minimum cost. WILLIAM JAMES.

Mystic, Iowa.

Locating a Booster Fan

Letter No. 1—In reply to P. J. Doolan, *Coal Age*, Mar. 25, page 550, I wish to say that the location of a booster fan is immaterial in so far as best results in quantity are concerned, provided, however, that the course of the air current in the mine is not altered.

Assuming that each fan when working under similar conditions by itself produces a circulation of 30,000 cu.ft. of air per minute, the two fans working together would produce, according to the well-known rule that makes the power ratio equal to the cube of the quantity ratio, a circulation of

$$\sqrt[3]{30{,}000^3 + 30{,}000^3} = \textit{say } 38{,}000 \textit{ cu.ft. per min.}$$

with the fan placed anywhere on the aircourse.

Bridgeport, Ohio. FRANK KAIN, JR.

[Let some of our fan engineers and others say whether the rule quoted by this correspondent will apply to the tandem location assumed in this inquiry. Or does the rule quoted here only apply when the fans are set side by side or otherwise are working independently on the same mine? A tandem arrangement is when the air discharged by one fan becomes the intake for the second fan.—Editor.]

The Ambulance Chaser

Letter No. 1—If it were not for its serious aspect, the incident recorded under Hillsboro, Ill., *Coal Age*, Mar. 4, p. 432, would be amusing, showing as it does the willingness with which some people permit lawyers to settle their claims for damage in case of accident or to enter suit for them, agreeing to allow the lawyer 50 per cent. of the amount recovered.

The incident to which I refer is one in which a coal company was sued for an accident that resulted in the death of a man. It appears that the case was carried to the higher courts on appeal, and it develops that lawyer No. 1 now has an attorney's lien of 50 per cent. of the judgment, which was $5,000 and interest, amounting in all to over $6,000. The company is willing to pay the money called for in the judgment, but has been notified by two other lawyers that they each have a 25 per cent. lien on the same judgment.

It is easy to see that if the lawyers have their way in this case the widow will have nothing. It is indeed a serious case if the parties who brought suit agreed to the payment of the remaining 50 per cent. of the judgment to these other lawyers who took charge of the appeal. It would seem that this was done in order that lawyer No. 1 might be able to secure the stipulated 50 per cent., which was his share.

Although knowing nothing of this accident or the parties whom it concerns, permit me to draw a mind picture of the widow after her breadwinner had been brought home lifeless. In order to keep the wolf from the door and sustain herself and possibly two or three children, she is obliged to take in washing or perhaps find a place in a factory where she can work.

Misled by Lawyer's Arguments

In a short time, a lawyer hearing of the accident and scenting a good case, by specious argument prevails on the widow to allow him to enter suit with the understanding that he is to retain 50 per cent. of the proceeds as his share. The widow is happy at the thought that the money she will get will permit her to return to the old country, if she is a foreigner, or to educate her children that they may be able to earn a better living for themselves. Now imagine her surprise when she is told that the case has been appealed and carried to the higher courts and that she must wait for the outcome; and finally picture, if you can, her condition when she at last realizes that the lawyers have absorbed the whole of the judgment that they have obtained, and there is nothing left to her. It must have been heartrending, indeed, for her to learn that she had been cherishing false hopes all these years since the case was first taken to court.

Compare this condition with what this widow might have secured for herself by making a settlement directly with the company without going to court. Suppose, for example, the company offered to settle the case out of court for $500 paid to the widow. Should the case be taken to court, a suit would be entered for $1,500 and perhaps a verdict given for $1,000, half of which would go to the lawyer. The widow would then receive no more than what she would have got without going to court.

Although the amount sounds larger and seems inviting, the results are no greater, and there is much risk, as is shown clearly in the incident to which I have referred. The old maxim is still true that in the settlement the lawyer gets the oyster while each of the parties to the suit must be satisfied with the shell.

My advice is, settle the case out of court. Mine superintendents are human, and when approached in the right way, there are few cases they will be unwilling to settle in a manner that will give as great satisfaction as could possibly result by a suit, and without risk of the widow being disappointed in the end. By doing this we can get rid of the "ambulance chaser." I am glad to say that the compensation law is doing wonders in this direction in many coal-mining states. OSTEL BULLOCK.

Cleaton, Ky.

Inquiries of General Interest

Difficulties in Coal Washing

For some time past we have been up against a proposition in regard to washing our coal that we have been unable to solve satisfactorily, and we would be glad to have suggestions from those who have had a similar experience that would tend to solve the difficulty. We are mining the Black Creek seam of Alabama coal, which is underlaid with a black fireclay that makes the mine water very muddy, with the result that the fine coal from the washery is found to contain a high percentage of ash, which makes it undesirable for use.

By the use of a Montgomery washer we have succeeded in reducing the ash content in the nut coal as low as 1.78 per cent., which we regard as exceedingly low. The next size is the pea coal, which has passed through a 7/8-in. revolving screen and over another $\frac{3}{32}$ revolving screen, the latter being a jacket around the former. Our difficulty lies in the fact that the fine coal that passes through the $\frac{3}{32}$ screen is more than we require to fire our boilers, and we are anxious to rewash this fine coal so as to use it for a blacksmith coal.

I want to ask whether it is not possible to take all of this fine coal and run it through a tank of clear water, the tank being built on the plan of the old Stewart washer or the Robinson washer, having a cone shape, and in which the coal is introduced at or near the bottom? The tank is provided with a central shaft having radial arms, which are kept in motion and serve to prevent the coal from settling to the bottom of the tank. The fine coal is thus made to flow over the top of the tank with the water, while the heavier mud settles to the bottom and is drawn off by two valves, much the same as in the Robinson washer mentioned previously.

W. L. SMITH, Mine Superintendent,
Altoona, Ala. Raccoon Mining Co.

In reply to this inquiry we are pleased to submit the following letter received from E. Paul Stewart, an engineer whose experience in the washing of coal renders him capable of giving the best information possible in regard to the elimination of the high-ash content in the fine coal due to the presence of the fireclay underlying this seam. Mr. Stewart writes as follows:

"I have noted with much interest the difficulty presented in this inquiry by reason of the presence of an excessive amount of fireclay in the washed product. In reply permit me to refer to my recent description of a washer installation of the Roberts-Schaefer Co., in the southern Indiana coalfield. In that case two principal results were required and successfully obtained by means of the special process employed—the careful sizing of the washed coal and the thorough removal of the fireclay.

"We have learned through years of experience in the Illinois coalfield and elsewhere that the only practical method of removing the fireclay from the washed coal is by the employment of a special shaker screen and sprays of clean water. In this process the washed coal is first dewatered as much as possible by means of a perforated-bucket elevator that delivers the coal to a shaker screen or screens where each size of coal is subjected to a thorough spraying of water. The smaller sizes of coal are then passed over a perforated area having $\frac{1}{16}$-in. holes, which permit the spray water to drain from the coal, carrying with it the fireclay. Whenever possible, this water should be run by a sluiceway to a waste point, or if the water-supply is limited, this waste water may be conducted to a large settling tank or pond, and after clarifying, can be used again. I may say that any system of fireclay removal that retains this water in circulation will prove a failure, as the fireclay will always adhere to the washed coal.

The shaker screen has many advantages over the revolving screen in this service, since the coal is spread out over a large area and a better opportunity is provided for the thorough spraying that is necessary for the complete removal of the fireclay. Also better results are obtained in the screening and sizing of the coal when shaker screens are employed. It may be argued that much fine coal will pass through the $\frac{1}{16}$-in. holes and be lost in the waste water, but as a matter of fact this loss is very small, depending on the amount and fineness of the coal and the volume of water required in spraying. There is usually just enough coal dust mixed with the waste water to turn it black, but the operator has the choice of this condition or having the fine coal saturated with fireclay, which would be practically removed in this process.

"Referring now to Mr. Smith's inquiry, I would suggest that he should install a shaker screen for the treatment of the fine coal, and thus provide for the more thorough spraying of the product passing through the $\frac{3}{32}$-in. screen. I gather from his letter that the cleaning and sizing of the coal is satisfactory except for the fireclay found in the fine coal coming from this screen. If this assumption is correct he would hardly be justified in replacing all of his revolving screens with a shaker screen installation such as I have described.

"If this change is made, the small shaker screen suggested should have a speed of 140 r.p.m., a 4-in. throw of eccentric and a perforated area consisting of bronze plates with as small holes as possible, say $\frac{3}{64}$-in. diameter. As this plate will be very thin, it should be supported by a $\frac{3}{16}$-in. steel plate having 2½-in. or 3-in. perforations. By passing the $\frac{3}{32}$-in. coal over this screen and using a liberal spray of fresh water, satisfactory results should be obtained and practically all the fireclay removed, making a superior blacksmith coal.

"The suggestion of passing this fine coal through a conical tank filled with water kept in agitation by paddles hardly offers a satisfactory solution of the problem, as sufficient agitation to cause the coal to flow over the top of the tank would also carry over the fireclay. The screen installation suggested above would be less expensive and prove more successful, while the closed tank would be an experiment, that is doubtful, to say the least."

Examination Questions

West Virginia Firebosses' Examination, 1916

(Selected Questions)

Ques.—If you were employed as fireboss in a gaseous mine how would you conduct your examination to ascertain the true condition of the mine?

Ans.—Having ascertained that the mine fan was running properly before descending the shaft, I would first proceed to the foot of the downcast or the main intake airway upon entering the mine, and note whether the usual volume of air was in circulation. From this point I would follow the intake air current to the mouth of the first split and proceed to examine the working places in order in each division or section of the mine, always following the air current, and entering each working place to examine the face and to make sure there is no gas accumulated therein and that the place is safe for work.

The examination should include an inspection of the roof and coal face, noting also the condition of the timber supporting the roof, which may have been dislodged by the blasting of the coal the previous shift. Every place examined and found to be safe for work should be marked plainly by the fireboss and should show the date of the examination. If the place is found to be unsafe in any respect the fireboss must bar each entrance to such place by putting a danger signal at the opening, so as to prevent any person from entering the place unwarned.

Ques.—What evidence would there be to show that you had examined all the working places therein?

Ans.—Besides the mark made by the fireboss at the working face of each place, giving the date of the examination, and the absence of any danger signal at the mouth of the room, the fact that the place is not reported as unsafe for work by the fireboss in his record book at the bottom of the shaft or that the miner's check is not removed from the board at the entrance of the mine is sufficient evidence that his place is safe for him to enter and proceed to work.

Ques.—What, in your opinion, is a miner's first duty on entering his working place in the morning?

Ans.—Every miner should examine the roof and the face of the coal upon first entering his working place and before doing anything else. He should observe that no timbers have been knocked out or loosened by blasting the coal the night before. He should also sound the roof and make a careful examination to detect any loose pieces of slate, fault lines or slips that may appear in the roof. If any timber has been displaced, this should be reset before the miner proceeds to work, and any new timbers that may be required should be stood in place at the same time. On reaching the coal face, examining the roof as he goes, the miner should look for the mark of the fireboss on the face of the coal, showing that the place has been examined that morning and found to be safe, as required by law. This should be done before proceeding to set any timbers that may be required.

Ques.—In your judgment, how often should the abandoned parts of a mine be examined?

Ans.—The frequency of the examination of abandoned parts of a mine will depend wholly on the conditions with respect to the extent of such abandoned workings, their condition and the circulation of the air current through them. Under reasonably safe conditions and where the return current of these places shows no particular increase in the percentage of gas present, it may not be necessary to enter and make a more thorough examination oftener than once a week. Under other conditions that render the abandoned parts of the mine a menace to safety, a careful examination of such places should be made regularly every day, to ascertain the condition of the roof strata, the possibility of falls and the accumulation of gas.

Ques.—When making the examination of abandoned parts of a mine and finding an accumulation of explosive gas, what method would you adopt to remove the same or make the abandoned portions of the mine safe?

Ans.—Where considerable gas has accumulated, all the men in that section of the mine should be withdrawn before any attempt is made to disturb or remove the gas. It may be necessary in such cases to remove all the men from the mine. Having done this and having safeguarded all entrances to the return airway to prevent men entering the same, and having selected only experienced men equipped with good safety lamps, the work of removing the gas should be started from the intake end of that section. Having done this, the next step is to increase the volume of air entering the abandoned section and proceed to erect such brattices as may be necessary to carry the air forward and make it sweep the places where gas has accumulated. In this work it will be necessary to keep the lamps where they will be reasonably protected against a rush of gas due to roof falls and to watch the lamps carefully, advancing only as the condition of the air will permit. In this manner the gas should be driven from all places where it is lodged until its removal is complete.

Ques.—In a gaseous mine where 160 persons are employed, would you consider the ventilation sufficient providing the quantity of air in circulation is equal to 150 cu.ft. per min per man?

Ans.—This volume of air would meet the requirements of the state mining law of West Virginia, except as the mine inspector decided that more air was needed for the proper ventilation of the mine. This could be determined only by an examination of the mine to ascertain the condition of the air at the working face. Without this knowledge of existing conditions in the mine, it is impossible to answer this question, which will depend wholly on the purity of the air at the working face and its gaseous condition, in connection with the quantity, character and fineness of the dust suspended in the air current.

Coal and Coke News

Washington, D. C.

A petition asking for a modification of the order of the Interstate Commerce Commission of last July involving the rates on coal from mines in Alabama, Illinois, Kentucky and Tennessee to many points in the Mississippi Valley has been filed with the Commission by the Alabama & Vicksburg Railway Co.; the Alabama Great Southern; the Gulf & Ship Island; the Illinois Central; the Mobile & Ohio; the New Orleans & Northeastern; the New Orleans, Mobile & Chicago; the Northern Alabama; the Southern; and the St. Louis & San Francisco railroads. In the order of the commission of last year it was held that the advanced rates to all points involved from mines in Alabama were justified with the exception of rates to certain points in Mississippi and Tennessee.

The petition just filed with the Commission states:

"In working out said schedule of rates to points in the Mississippi Valley generally, your petitioners have been governed by and have endeavored to maintain the rates to the sixteen specific points named in the order in I. & S. Docket No. 569, supra. To five of said points petitioners seek authority to establish as a part of the general readjustment, rates higher than those named in the order of the Commission, the said points and the said rates, taking Southern Railway Group 3 as illustrative, being as follows:

To	Rates Prescribed	Rates Proposed
Jackson, Miss.	$1.45	$1.60
Hattiesburg, Miss.	1.50	1.60
Ellisville, Miss.	1.45	1.55
Laurel, Miss.	1.45	1.55
Enterprise, Miss.	1.25	1.30

"Petitioners respectfully show that rates less than those shown as proposed rates to the above stated points are so low as to work a hardship on petitioners, requiring not only what petitioners respectfully represent are unreasonably low rates but requiring no higher at intermediate points and largely destroying the consistent adjustment of rates throughout the territory generally, which petitioners and other carriers involved are endeavoring to establish to the entire territory."

HARRISBURG, PENN.

Denial is made at the state Department of Mines, of news items appearing in the papers recently, to the effect that Governor Brumbaugh has ordered that the 55 state mine inspectors, "must put in a full 8-hr. day every day but Sunday."

"Orders to the mine inspectors are issued by the Chief of the Department of Mines," says James E. Roderick, chief of the department, "and not by the Governor who is too broad minded to interfere with the head of a department and his employees. "It would be ridiculous to issue an order of this kind, as the mine inspectors are now putting in from 6 to 8 hr. each day in the mines, besides spending several hours at their offices at clerical work, etc., after returning there from them."

Mr. Roderick further states, that it would be almost impossible to limit the hours of the mine inspectors, as in many emergencies, such as mine fires, floods, disasters, cave-ins, rescue work, etc., an inspector may be on duty almost constantly for several days, getting little rest or sleep. It was also pointed out that the inspectors are subject to call at any hour of the day or night in case of trouble and that it would be detrimental to the state inspection service to issue an order limiting the hours of the inspectors.

The State Has No Claim

That the Commonwealth of Pennsylvania has no claim to excess charges collected by the coal operators and dealers under guise of protecting themselves because of the 2½ per cent. tax on anthracite coal, since this was declared unconstitutional, was the opinion expressed recently by the Attorney General's Department.

This opinion is based on the escheat proceedings filed some months ago by an attache of the Auditor General's Department as a precautionary measure for the state.

Numerous requests for advice from coal operators who admit having collected additional sums in excess of the regular price are being answered now by the department through Deputy Attorney General Hargest. He is advising such dealers that they are safe in refunding such money to the purchasers who paid the tax money.

It is said at the Attorney General's department that no escheat proceedings can be made by the state where persons who paid the money to dealers are known. The state can step in only in cases where the persons who paid such sums have died and left no heirs. Such cases are believed to be too few to warrant attention.

Under this ruling each consumer must take up individually his own case with the dealers to whom the tax levy was paid.

Coal Company Is Fined

In imposing a fine of $100,000 upon the Lehigh Coal and Navigation Co., in the United States District Court on Mar. 31, Judge Reilstab took occasion to outline the theory upon which the Federal Government seeks to prohibit rebating on the part of common carriers. The coal company had been found guilty on 27 counts charging it with accepting rebates from the Central Railroad of New Jersey on shipments of coal from Nesquehoning, Penn., to Elizabethport, N. J.

The entire day's session of the court was devoted to hearing testimony and argument in behalf of the coal company for leniency and the plea of the counsel for the Government that a substantial fine be imposed, both as punishment to the coal company and as a deterrent to other possible violators of the interstate commerce law.

Ex-Judge Beitler, counsel for the coal company, made a novel charge, namely, that the Central R.R., which was recently fined $200,000 for granting the rebates, had made no bona fide effort to defend the suit, but had, in fact, won a distinct victory through its conviction, notwithstanding the $200,000 fine.

He added that by the decision declaring illegal the "lateral allowances" claimed by the coal company under its lease, that corporation would lose $100,000 a year for the next 950 years, the life of the lease. He intmated the Central Railroad of New Jersey would be a corresponding gainer by the decision.

Judge Reilstab, at this point, remarked that the imposition of a fine is, at best, a silly way to punish a wealthy corporation. He deplored the apparent lack of respect for authority and disregard for the law manifested by the present generation in business affairs and otherwise.

"In my judgment," said the Court, "there must be a substantial fine. There must be a distinction observed as to the culpability as between the Central R.R. and the Lehigh Coal and Navigation Co. They did not benefit in the same manner, but both are legally and morally culpable."

Remarking that at one time the coal company was entitled to concessions under its contract or lease, which was not a violation of the law when entered into, Judge Reilstab nevertheless emphasized that the policy of the Government had been changed respecting rebates and concessions by quasi public corporations.

It has been unofficially announced that the coal company will appeal from the fine.

PENNSYLVANIA

Anthracite

East Scranton—A serious cave-in and flood in the Pine Brook colliery of the Scranton Coal Co. took place on Mar. 30. The cave-in occurred in Roaring Creek in Nay Aug Park and was about 6 ft. in diameter. The water from the creek flowed rapidly into the mine and help was called in an attempt to stem the tide. Baled hay, bags of sand, and anything else available was used and finally the flow of water was stopped. There were several men in the mine at the time, but all were gotten out safely.

Jenkins—Now that the frost is leaving the ground the Butler colliery of the Hillside Coal and Iron Co. is bothered with surface water entering the mine, but owing to recent improvements officials are able to cope with the situation. Seeing the water accumulate they opened the dam inside and let the surplus run to Pennsylvana No. 4 shaft where the mammoth pumps were able to handle it. A report gained circulation that much damage was done to the inner workings and many lives were endangered, but such was not the case.

Shamokin—Michael Schultz and George Lokokosie were recently blown down a breast at the Philadelphia & Reading Coal and Iron Co.'s Henry Clay shaft by an explosion of gas when Lokokosie unscrewed the top of his safety lamp to light a cigarette. Both were badly burned.

Hazleton—The United Mine Workers of District No. 7 have started a movement to open a coöperative store here. Local No. 2077 is back of the campaign.

Edwardsville—The Delaware, Lackawanna & Western Railroad Co. has started the steel work on the new breaker at its Woodward colliery. This breaker will be constructed entirely of steel and concrete and when completed will be one of the biggest breakers in the anthracite region. For a number of years this colliery led all others in output.

Tamaqua—The Lehigh Coal and Navigation Co. has prepared plans for the erection of a new modern coal breaker this coming summer to take the place of No. 11 breaker.

Nescopeck—The Lehigh Valley Coal Co. is figuring on the driving of a $100,000 tunnel from the Hazleton basin through the Butler Mountain to the Nescopeck Creek. Action will not be taken until an agreement is reached between the miners and operators that is satisfactory.

Plymouth—Breaker boys in the No. 3 colliery of the Delaware & Hudson Co. declared a strike on Mar. 30 and tied up the operation because company officials transferred a boy from No. 2 colliery to attend the "jigs", instead of promoting one of the boys at No. 3 breaker. Union leaders have endeavored to induce the boys to return to work, but they refuse.

Bituminous

Johnstown—An explosion occurred Mar. 30 in the Robindale mine of the Conemaugh Smokeless Coal Co. at Steward resulting in the death of eight men. This is believed to have been a gas explosion and was one of the most violent ever occurring in Pennsylvania. All bodies removed were badly mangled and burned.

Monongahela—The trade in river coal has been steadily decreasing for some time and many of the barges and towboats which used to ply the river are now sent to the Kanawha River field of West Virginia where coal is loaded for the southern trade. The recent removal of docks from this city and the fact that no repair work is being done on the fleet of empty craft moored at this place, leads many to believe that the coal trade by river to southern markets is about over.

Charleroi—Coal exhaustion will shortly result in the permanent suspension of the Schoenberger Mine of the Pittsburgh-Westmoreland Coal Co. at Baird Station near Donora. This location which was an important producing center a few years ago is now showing evidences of depletion, and Baird Station as a mining village is beng vacated.

Connellsville—With 88½ per cent. of the ovens in operation, the coke production recently aggregated 459,000 tons and shipments 456,000 tons. Spring freshets interfered somewhat with shipments in the lower Connellsville region where most of the merchant operations are. This difficulty was not, however, as great as was expected.

Belle Vernon—Miners in the Belle Vernon district are debating whether the screen system of pay or the proposed run of mine basis is the better for them. The proposed new scale submitted to the miners, as a result of the recent district convention in Pittsburgh is being hotly discussed, without any definite decision. At other mines along this valley the same problem is being considered.

Indiana—The Imperial Coal Co., by a deal, which was recently consumated will handle the output of the Creamer Coal, Coke and Slate Co., of Creamer, Penn. The deal includes the formation of the Diamond Smokeless Coal Co., for which an application for a charter has been filed, and which company will in turn lease the operating plant and part of the coal holdings, about 2,500 acres, of the Creamer company's property in Indiana County. The deal will take in the new town of Charles, situated in the immediate vicinity. The incorporators of the new company are James P. Thomas, Frank D. Baker, Charles A. Owen, Phillip E. Thomas, Edward H. Zimmerman and H. A. Ling, all of Johnstown. The new company intends to enlarge the plant and push the operation to full capacity.

Pittsburgh—Most of the mines along the Monongahela River will continue to operate while the details of the new scale are being worked out. The run-of-mine scale will be installed on the 1¼-in. basis, payment to be made at a rate of 5 cents over the previous price for machine mined coal. Five per cent. additional will be paid on day and and dead work prices. The run-of-mine scale will be installed within 90 days.

Irwin—Operators in the Irwin bituminous coal field on Apr. 1, posted notices at the various mines, of an increase in wages. The scale will be 90 cents for pick mining, a five-cent advance over the former rate. Machine cutting and loading is raised from 52 cents to 58 cents. These rates are for the net ton, meaning the screen system will prevail. Day labor is raised in proporton, drivers to receive $3.05 a day. The companies who have signed the new scale include the Westmoreland Coal Co., Penn Gas Coal Co., Keystone Coal and Coke Co., Ocean Coal Co., Baltimore & Pittsburgh Coal Co., W. B. Skelly Coal Co., Adamsburg Coal Co. Export Coal Co., Manor Gas Coal Co., and Delmont Gas Coal Co. About 7,000 men are affected. The companies last year produced around 7,000,000 tons of coal and coke.

WEST VIRGINIA

Moundsville—The Panama mine of the Ben Franklin Coal Co. recently suspended operation owing to high water This mine shuts down when the water reaches approximately the 30-ft. mark.

Bluefield—Three men were killed and 20 injured by an explosion on Mar. 28 in the mine of the King Coal & Coke Co. at Kimball near here. A number of the injured were badly burned and are in a critical condition.

Williamson—The Borderland Coal Co. mining on the Kentucky side of the Tug River but loading on the West Virginia side, will build a new steel tipple to replace the one recently destroyed by fire. L. E. Armentrout is general manager at Borderland, W. Va.

Powelton—The Mt. Carbon Co., Ltd., is opening a new mine 90 ft. above the present one. G. H. Powell is general manager. A new tipple will be constructed.

Leewood—The Cabin Creek Consolidated Coal Co., Josiah Keely, general manager, is displacing its compressed air plant with electric power purchased from the central station serving that field.

Charleston—In an effort to relieve the car shortage which has for some months seriously hampered the coal industry, the West Virginia Public Service Commission has entered an order permitting all railroads in the state to increase demurrage charges from $1 to $2 a day. The order became effective Apr. 1, and will continue in force until June 15.

Fairmont—The contract for the construction of the Fairmont & Bingamon R.R., from Hutchinson to Wyatt, a distance of six miles, has been awarded to the Miller Construction Co., of Lock Haven, Penn. The new line is a part of the Western Maryland system, and will connect with the Baltimore & Ohio near Hutchinson, serving as an outlet for the mines of the Consolidation Coal Co. at Wyatt.

West Virginia coal operators, meeting here a few days ago, made preparations for fighting the proposed increase in freight rates on West Virginia coal at the hearing, before the Interstate Commerce Commission on Apr. 24. It was declared that if the proposed increases are granted it would prove ruinous to the coal industry of the state. Arthur Hale, who becomes traffic manager of the Consolidation Coal Co. on May 18, C. H. Jenkins, president of the Central West Virginia Coal Operators' Association, and R. B. Isner constitute a conference committee which will have charge of the presentation of the coal operators' side of the case at Washington. The West Virginia Public Service Commission is assisting the coal men in the fight.

ALABAMA

Birmingham—C. H. Nesbit chief state mine inspector has announced that Alabama's coal production for 1915 was 15,266,331 tons, and the coke production 2,780,976 tons. The production is considered excellent as many furnaces were out and many mines closed down during the first half of the year. Mr. Nesbit believes the coal production for 1916 will exceed 17,000,000 tons and the coke 4,000,000 tons, judging from the past three months. Jefferson county produced about half of the state's production. There were 63 deaths in coal mines of the state during 1915, or one death for every 242,321 tons of coal mined. The death record is the lowest since 1893.

KENTUCKY

Lexington—This city has been selected as the place of holding the next annual convention of the Kentucky Mining Institute, which has a membership of 350. The gathering will be held on May 12 and 13. One of the features of the meeting will be a first-aid contest to be staged in the stadium at the University of Kentucky. Mining companies from both the Eastern and Western fields have entered teams and it is expected that $500 in prizes will be awarded. Kentucky ranks fifth in coal production and the eastern field is moving forward very rapidly.

Shawnee—A five-week strike at the Hanna-Essex Coal Co.'s mine at Pine Run ended after Secretary-Treasurer Savage, of the United Mine Workers of America, had conferred with both the operators and miners. He advised the men to go back to work. The strike was called when the mine committee protested against the placing of one machine man.

OHIO

Columbus—The strike at several of the strip-pit operations in Jefferson county, which resulted in a small sized riot at Parlette, has been settled and the men are arranging to return to work at once. The operators of all of the strip-pits got together to treat with the miners. An advance of 5 per cent. was given all men, which work by the day. The minimum wage for any man is $2.47 per day and the maximum $2.98. Steam engineers which are in a separate class are given an advance from 45 to 50 cents an hour for 8 hr. work. The companies signing were the Beech Flat Coal Co., the Modern Mining Co., the Piney Fork Coal Co., and the Witch Hazel Coal Co. Another operation, the Hopedale Mining Co., backed by Pittsburgh capitalists will soon start operations a mile west of the plant of the Modern Mining Co.

A strong organization has been effected among operators in the Pittsburgh No. 8 district for the purpose of gathering statistical information as to the cost of producing coal. This information will be gathered by expert accountants and one of the objects will be to educate the various operators in the district as to the cost of producing coal. It is claimed that operators in that district as well as other mining regions have been deceiving themselves as to the cost of producing coal and have been doing business at a loss. The plan of organization is modeled after the Illinois Operators Association. C. P. White, formerly connected with the Carnegie Fuel Co., of Minneapolis has been selected as secretary of the organization.

INDIANA

Clinton—It was supposed the chief opposition to the acceptance of the mine-run basis of paying miners in the Indiana field would come from this and the Terre Haute fields. The referendum votes so far taken by the locals are strongly in favor of acceptance. Operators are preparing to rebuild or remodel tipples, so that the weighing will be above the screens.

Princeton—The drivers in the Princeton mine, who went on strike because one of them was discharged, returned to work, after a week's idleness, during which 350 miners were also forced out. The state board is to settle the trouble.

ILLINOIS

Belleville—The St. Louis & O'Fallon Coal Co. has been granted a temporary writ of injunction against the tax collector of Caseyville Township, restraining him from collecting $1,201.33 taxes assessed against the company on its capital stock. The company alleges that the assessment, made by the Board of Review, was without authority. A number of other corporations have resorted to the same procedure.

Hillsboro—The Kortkamp Coal Co. is confronted by two sets of claimants, under the State Compensation Act, for the benefits for the death of Harry M. Enos, an employee of the company, who died Dec. 8, 1915, from injuries. J. E. Tanner, of Springfield, state arbitrator of the Industrial Board, has been taking testimony here. The claim was first filed by Enos' widow, Mrs. Caroline Enos, on behalf of herself and her two children. When the case was called the children of Enos by a former marriage presented their claim, which is based on the allegation that his second marriage was null because it took place within a year from the time that he was divorced. The amount to be awarded is about $3,500, equivalent to four years' earnings of the deceased.

Springfield—Coöperative stores established in many Illinois mining towns have not proven a success, according to a report that has just been made by Frank Farrington, president of the United Mine Workers of Illinois. The report deals with 27 stores in existence at the time that it was compiled. Farrington says the stores are not being supported sufficiently to make them a permanent success. Two, one at Peoria and one at Streator, had to discontinue because of lack of patronage. An attempt is being made to establish one of the stores in Belleville.

MISSOURI

Kansas City—The Kansas state board of administration has given permission for the mining department of the University of Kansas, at Lawrence, to sink a mine there. A. C. Terrill, professor of mining, at the college, announces that this will be done in order to give practical instruction and real practice to mining students at the University.

PERSONALS

H. H. Lineaweaver & Co., Inc., coal operators, has been appointed line sales agent for the Corbin Coal Co.

A. W. Hamilton, manager of the St. Louis Branch of the Peabody Coal Co., is confined to St. Lukes hospital, St. Louis, having recently undergone an operation. He is reported as doing well.

William W. Heintz on Apr. 1 assumed the duties of secretary and treasurer of the Berwind Fuel Co. with office in the Peoples Gas Building, Chicago, Ill., succeeding Victor R. White, resigned.

Charles A. Owens and James P. Thomas, president and vice-president of the Imperial Coal Co., have opened offices in the Widener Building, Philadelphia, to look after the interests of the company.

J. A. Jeffries, general manager of the Kerens-Donnewald Coal Co., St. Louis, returned to his home in St. Louis recently from Springfield, Ill., where he had been in a hospital several weeks from injuries received in a railroad wreck.

J. J. Wolfersperger, who recently resigned as superintendent of the Yampa Valley Coal Co., at Oak Creek, Routt County, Colo., is visiting his father at Sterling, Ill., and expects to make a business trip to Colorado early in April.

Dr. William F. Rittman, inventor of a process for obtaining a greater yield of gasoline from crude oil, recently resigned as chemical engineer in the Bureau of Mines, to become vice-president and acting head of a new corporation now being organized in Pittsburgh to manufacture gasoline.

E. G. Lawrence, for several years sales manager in Chicago for the Lumaghi and Williamson County Coal companies, will succeed to the duties of general sales manager at the St. Louis offices in place of J. J. O'Donnell, resigned. Mr. O'Donnell will assume a similar position with the West Virginia Coal Co., of St. Louis.

J. H. Hall, superintendent of the Elkhorn Coal Co.'s mine at Kona Station, is in a Lexington, Ky., hospital, receiving treatment for a dangerous bullet wound which he received while playing the peacemaker during a fight at Kona Station on the evening of Mar. 30. Sam Marcum, a well driller, is dead. Marcum is alleged to have attacked Edward L. Williams, a clerk at the store in Kona.

Francis O. Froeb, wholesale leather dealer of Terre Haute, Ind., has been appointed receiver for the Clay County Block Coal Co., operating a mine at Coal Bluff, Vigo County, Ind. It is alleged the company has an indebtedness of $70,000 long past due. The company is said to be hampered by a lack of capital, the property being a good one. It was formerly owned by the Ehrmann Coal Co., of Terre Haute.

C. D. Boyd, of Knoxville, Tenn., who for the past 11 years has been general freight agent, in charge of the traffic department of the Atlanta-Cincinnati division of the Louisville & Nashville R.R., has been appointed general coal and coke agent of the Louisville & Nashville System, with headquarters at Louisville, Ky. This is a new position created on account of the great development of the coal fields in Kentucky, Alabama, Tennessee, Illinois, Virginia and Indiana served by this railroad.

RECENT COAL AND COKE PATENTS

Mine Car. J. E. Renshaw, Coalburg, Ala. 1,175,178, Mar. 14, 1916. Filed June 7, 1915. Serial No. 32,798.

Miners' Safety Lamp. W. Best, Morley, Eng. 1,176,423, Mar. 21, 1916. Filed Dec. 1, 1915. Serial No. 64,422.

Gas Producer. B. Versen, Dortmund, Germany. 1,175,844, Mar. 14, 1916. Filed Nov. 3, 1913. Serial No. 799,018.

Mining Machine. E. C. Morgan, Morgan Park, Ill. 1,175,071, Mar. 14, 1916. Filed June 27, 1910. Serial No. 569,169.

Miners' Gas Burning Lamp. F. E. Baldwin, New York, N. Y. 1,174,035, Mar. 7, 1916. Filed Feb. 2, 1912. Serial No. 675,026.

Smoke Consumer. O. W. King, Fort Worden, Wash. 1,176,465, Mar. 21, 1916. Filed Dec. 19, 1914. Serial No. 878,075.

Mine Breathing Apparatus. W. E. Gibbs, New York, N. Y. 1,176,711, Mar. 21, 1916. Filed July 9, 1915. Serial No. 38,880.

Hollow Grate Bars. R. Grabowsky, Hanover, Germany. 1,177,320, Mar. 28, 1916. Filed June 29, 1915. Serial No. 36,980.

Automatic Mine-Car Stop and Release. W. K. Anderson, Worden, Ill. 1,176,123, Mar. 21, 1916. Filed Sept. 15, 1913. Serial No. 789,867.

Mine Car. M. S. Simpson, assignor to Pressed Steel Car Co., Pittsburgh, Penn. 1,176,782, Mar. 28, 1916. Filed July 29, 1915. Serial No. 42,656.

Apparatus for the Electric Transmission of Signs or Speech in Mines. J. H. Reineke, Bochum, Germany. 1,175,082, Mar. 14, 1916. Filed July 16, 1912. Serial No. 709,660.

INDUSTRIAL NEWS

Duquoin, Ill.—The Forester Coal and Coke Co. of Duquoin recently awarded a contract to the Roberts & Schaeffer Co. for a Rands loading boom for installation at the company's tipple.

Port Clinton, Penn.—It is reported that the transportation of coal via the Schuylkill Canal will be delayed until late in the spring or until the culm washed into the channel by the winter floods can be removed.

Philadelphia, Penn.—On Apr. 1, the Cambria Steel Co. took up offices to the Widener Building. W. S. Ottinger, formerly assistant general manager of sales, has been placed in charge of the advertising of this company.

Hallidayboro, Ill.—The Jackson Coal Co. expects to remodel its tipple and coal washing plant and install various improvements at Hallidayboro. The Roberts & Schaeffer Co. of Chicago has been given a contract for this work.

Ehrenfeld, Penn.—The Pennsylvania Coal and Coke Corporation recently awarded the Roberts & Schaeffer Co., of Chicago, a contract for a Marcus patent picking screen and coal handling equipment for installation at this firm's mine.

Birmingham, Ala.—Arrangements are being made by James Galey, chairman of the reorganization committee, for the reorganization of the Sheffield Coal and Iron Co. It is proposed to obtain about $1,000,000 new capital by issuing new securities to present bond and stockholders.

Boston, Mass.—The "Jerome Jones," the five-masted schooner recently launched at Bath, Me., has been chartered to carry a cargo of 2,500 tons of coal from Norfolk, Va., to the River Platte, at a freight of $20 per ton. A similar charter has been given the five-masted schooner "Harwood Palmer."

Vancouver, B. C.—C. F. Law, manager in British Columbia and Alberta for the interests of Lord Rhonda, advises that the coal magnate is ready to negotiate with the British government to construct a line of railway from Prince George into the Peace River country for a distance of 450 miles.

Montgomery, W. Va.—The New River Collieries Co. has contracted with the Diamond Construction Co. of Huntington for 25 first-class miners dwellings. It will let the contract in the next few days for a new hotel with 26 bedrooms, all of good type. This firm will also build a modern amusement hall with bowling alleys, billiard rooms, etc.

New York, N. Y.—B. Nicoll & Co., Singer Building, New York, has been appointed exclusive sales agent for the coal from the Dorothy and Sarita Mines as well as that from the Annabelle Mines formerly owned by the Four States Coal and Coke Co. M. F. McDermott, formerly manager of sales for the Four States company has become associated with B. Nicoll & Co.

Jefferson City, Mo.—The Public Service Commission has cancelled the maximum and mileage rate schedules enacted by the Missouri Pacific and Iron Mountain railroads, and ordered them to restore the blanket or zone rates on coal to enable the more distant mines to secure a market. Under the proposed schedule some rates were advanced from $1 to $1.75 per ton, which brought forth strong protests.

Buffalo, N. Y.—Pickands, Mather & Co., of Cleveland, who practically control the harbor fueling on Lake Erie, have announced the following uniform prices for all ports: $2.95 net for three-quarter, $2.85 for mine-run, $2.75 for nut and $2.40 for slack, from the car dump and 15c. extra from the lighter. A cargo price has also been fixed at $2.50 for lump, $2.40 for three-quarter, $2.30 for mine-run and $1.80 (gross) for slack.

Huntington, W. Va.—All previous coal-loading records established by the Chesapeake & Ohio R.R. were broken when 2,494,250 tons of coal was loaded in the month of March. During the past month 42,520 more tons of coal was loaded than in January, which up until March was the record month. Eight hundred sixty-nine thousand nine hundred forty-five more tons of coal was loaded during March than in the same period last year.

Oliphant, Penn.—One hundred thousand tons of coal which has been in storage at Oliphant for the past several months was recently sold by the Hudson Coal Co. to the Standard Oil Co. The price paid is not known but is said to be somewhere around $2 per ton. Work of shipping the coal has already commenced and it will be delivered to plants in Pennsylvania, New Jersey and Ohio. This is believed to be the largest amount of coal ever purchased in a single transaction.

Columbus, Ohio—The committee to have charge of the arrangements for the annual meeting of the Michigan-Ohio-Indiana Coal Association, which will be held at Cedar Point, Ohio, Aug. 1, 2 and 3, has been appointed. C. M. Anderson, of Columbus, is chairman; Charles T. Harther, of Toledo, treasurer, and B. F. Nigh, secretary of the association, secretary. It is promised that the program will be more pretentious than ever before. A fine entertainment program will also be arranged.

Harrisburg, Penn.—The Retail Coal Merchants' Association of Pennsylvania is planning to bring the 1916 convention of the coal men to Philadelphia. It was also stated that when the 1915 convention adjourned at Wilmington the matter of selecting the time and place for the next convention was left to the officers of the body to settle. Philadelphia has not had the convention for many years, and efforts are being made to take the Pennsylvania retailers there for the annual conclave and outing.

Chattanooga, Tenn.—An order was recently made by Referee James M. Anderson for an immediate private sale of the plant and properties of the bankrupt Dayton Coal and Iron Co. Under the terms of the order, the sale is to be conducted by W. A. Allen, into whose hands the entire assets of the bankrupt firm were recently transferred. Mr. Allen is to dispose of the property at private sale for cash, subject to the approval of the referee. The value placed upon the property by appraisers was $725,377.50.

Boston, Mass.—The Darrow Mann Co., of Boston, is steadily increasing its fleet. In addition to the three new steamers now building at Camden, N. J., and to be delivered about June 1, this firm has placed a contract for two other steamers 369 ft. long with capacity tonnage of 8,500. They will be constructed by the New York Shipbuilding Co., of Camden, N. J. This concern has also recently purchased two lake steamers, the "Selwyn Eddy" and "Harvey Brown," 4,500 tons each. They will be brought to the coast soon and used in the coal trade.

Philadelphia, Penn.—With but one or two exceptions the month of February was the most successful in the history of the Philadelphia & Reading Coal and Iron Co. The gross receipts for the month were $3,508,006, as compared with $1,890,585 for February, 1915, or an increase of $1,617,420. The surplus for the month after deduction of operating expenses was $216,569, as compared with a deficit of $164,530 for February, 1915. It is intimated that the month of March will even make a much better showing than this, and is only likely to be exceeded in the amount of tonnage moved in the month of March, 1902.

Toronto, Ont.—At the annual meeting of the Nova Scotia Steel and Coal Co., at New Glasgow, N. S., on Mar. 29, Col. Thomas Cantley, the president, in reviewing the operations of the company, stated that owing to shortage of steamers for transportation and skilled labor, mining was not carried on so vigorously as in former years, the total coal output being 618,103 tons, or 134,050 tons less than the previous year. Of this 284,971 tons, or 110,323 tons more than during the previous year was used in the iron and steel and other plants. The coal consumption of the company on account of larger operations was likely to show a further increase this year, so that coal sales in the market would be comparatively small.

St. Louis, Mo.—R. W. Ropiequet, of Belleville, Ill., attorney for the Coal Operators' Traffic Bureau, of St. Louis, filed with the Interstate Commerce Commission at Washington recently a brief in support of the operators' protest against the proposal of the Southern Ry. and the Chicago & Alton to increase the rates on bituminous coal from $1.90 to $2.10 per ton from mines in the Belleville district to Kansas City and other Missouri points. Attorney Ropiequet contends that the roads have not attempted to justify the increase and argues that all the evidence submitted by the carriers tends to uphold the reasonableness of the $1.90 rate. The rate was formerly $2.05. The carriers voluntarily reduced it to $1.80 Now they want to raise it again.

Market Department

General Review

Anthracite offered at concessions and uncertainty is the predominating note. Bituminous weaker and hinging largely on the labor conferences. Exports heavy. Lake opening delayed. Middle Western situation dull and large number of mines suspending operations.

Anthracite—A peculiar deadlock exists between buyers and sellers in the hard-coal trade. The continuation of the winter price schedule has caused the dealers to hold off buying, while operators are indifferent about making sales owing to the uncertainty concerning the labor negotiations, and even go so far as to warn buyers that all quotations may be withdrawn. Buying at the moment is confined to consuming interests who always stock up at this time of the year, and who are adhering to their usual practice, though in a restricted way. It has recently developed that large blocks of individual coal have been offered at substantial reductions on the regular circular, though indications are that very little business has been done even with these inducements. The uncertainties in the bituminous trade have tended to stiffen up the steam grades, while embargoes against New England shipments continue as rigid as ever.

Bituminous—With the mining interests professing a firm belief that the wage conferences in the central Pennsylvania district will wind up in a disagreement, there is a distinct note of suspense and uncertainty in trade circles. In spite of these conditions prices have shown a weakening tendency, except to points where embargoes are in effect, though it is noted that some interests are withdrawing options, and it is difficult to see where other factors will be able to meet their contract obligations in event of a deadlock at the wage conference.

Exports—The export movement over the Hampton Roads piers continues very heavy, though it has not attained to the record-breaking proportions of last August. The announcement that the British Government would requisition a number of vessels to go to South America for grain caused the most perceptible reaction in vessel rates to that point for a long time; the reopening of the Panama Canal has been a further contributing influence toward an easier freight market, but in other directions freights are stiffer, if anything, it being almost impossible to obtain charters to European ports because of the heavy demand for grain and other cargo.

Lake Trade—Ice conditions are unusually severe on the Lakes and former hopes of an early opening have been definitely abandoned; shipping cannot get underway before the middle of the month at the earliest, though loading is being started at some of the ports. In the meantime, the current situation continues quiet but rather uncertain. There is a tendency to force the market in order to keep the mines running and hold the mine organizations together in anticipation of an active demand later. Buying, on the other hand, is more restricted, domestic consumption having practically ceased with the advent of spring, while steam users are drawing largely on the reserves accumulated in anticipation of a possible suspension. As a result, consignment coal is more plentiful and more difficult to move, before demurrage accrues.

Middle West—The market is dull, many of the large steam consumers now drawing on their supplies of storage coal, while a number of mines are preparing to close down temporarily. However, prices are holding firm, except on an occasional tonnage of consignment coal that has to be sacrificed in order to avoid demurrage. The uncertainty in the labor situation, the New York agreement apparently being uniformly unsatisfactory to all concerned, is causing some uneasiness. Negotiations on new contracts are progressing in a satisfactory manner, the basis ranging from 5 to 10c. above last year's figures. A large number of contracts have been concluded in the past week or two, particularly for Lake coal, prices on which are understood to be somewhat above the figures mentioned. Lake shippers are impatiently waiting the opening of navigation and a heavy rush of coal is expected.

A Year Ago—Heavy movement of anthracite, but the outlook is not encouraging. Bituminous slightly firmer, though buyers predict a further recession. Some large contracts still open. No improvement in the prospects for the Lake trade.

Business Opinions

Boston News Bureau—The situation continues as favorable as could be expected in view of the world-wide war. It is evident that the position of the allies is improving more than that of the Germans, and the world is happier because of this. We are coming up now to the question of crops, and at the moment this is not too encouraging, although with the exception of winter wheat, it is too early to form any valued opinion. We in this country are particularly fortunate. We are doing an enormous business, as is shown by the increased return upon invested capital, and we are sane with it all. We are strengthening our position all along the line. There is every reason, however, for the unusual conservatism everywhere manifested. It is not only a question as to the length of the war, but it is a question of the crops, of the tariff, of the political situation.

Iron Age—March brought the production of American iron and steel to new and astonishing figures, so that the rate for pig iron is now practically 40,000,000 tons, and for steel ingots 43,000,000 to 44,000,000 tons. At the same time mills made no headway in March in overtaking orders; some of them fell farther behind. Significant in its bearings on rail prices and expectations of the duration of large consumption of steel is an announcement just made by the United States Steel Corporation that its rail-making subsidiaries "have decided to maintain the present prices until May 1, 1916, as to rails sold for delivery up to May 1, 1917, but will make no commitments beyond that date."

Bradstreet—After eight months of steady expansion trade still continues on the up grade, and its chief characteristic is sustained activity. More seasonable weather has come along to stimulate retail distribution; the old plaint of lack of materials, as well as of car shortages, is as loud as ever; prices keep on rising, practically every report speaking of this feature as a factor that fails to discourage business. Indeed, fear of still higher prices causes purveyors to continue to rush buying, to actually bid up the markets against themselves, and to completely overturn the long-practiced policy of buying from hand to mouth that prevailed in the years following 1907.

Dun—It is reassuring, at a time of unprecedented business activity, that conservatism is increasing rather than diminishing. Confidence is widespread in the continuance of record-breaking achievements in production and distribution, but there is now a more general disposition to avoid speculative excesses and to guard against over-extension in any quarter. This spirit of caution is manifested in the efforts to check the rapid rise of prices in the steel industry, as well as in the textile markets and other leading lines. Commercial failures this week in the United States, are 381 against 380 last week, 327 the preceding week and 472 the corresponding week last year.

American Wool and Cotton Reporter—Domestic wool sold during the week under review would show a loss if sold on a basis of the prices for new contracts, because the ideas of the growers are still so high. When the cheap Australian wools have been absorbed, the manufacturers will turn more to the domestic wools. The woolen-goods market has not been very active during the week. The productive capacity is sold up more than most purchasers realize and upon this condition the price situation is likely to hinge. There has been a much greater number of inquiries for merchandise for export purposes.

Dry Goods Economist—Considering that many manufacturers are not seeking orders at present trade has been fairly active during the week. Jobbers, as a rule, have their men on the road to obtain orders for fabrics for next fall and winter, as well as for current demands on those goods and on others. In several lines, however, manufacturers realize that due to the backward spring retailers have not yet had a chance to dispose of their initial stocks of seasonable goods.

Marshall Field & Co.—Current wholesale shipments of dry goods show a considerable increase over those of the corresponding week of past years. Road sales for both immediate and future delivery are in greater volume. More customers have been in to the market. Prices are firm, and the merchandise situation is reaching an acute stage in some lines.

ATLANTIC SEABOARD

BOSTON

Apprehension over the extra tonnage of Pocahontas and New River that is likely to be thrown to New England because of railroad congestion. Georges Creek available only in small quantities. Pennsylvania shippers upset by labor uneasiness. Anthracite deliveries still slow.

Bituminous—Pocahontas and New River at Hampton Roads continue the even course of the past few months, output somewhat less than normal on account of the shortened supply of boats, but movement good and dispatch excellent. Cargoes are coming forward on new contracts but there is a decided lull in spot business. Apparently there is no longer any pretense of asking $3 f.o.b. and actual quotations range from $2.75@2.85. Equally there is little doing on new contracts except in scattered instances where either buyer or seller controls marine transportation.

The Georges Creek shippers are apparently making no effort to sell. The output is still very much curtailed by the inadequate car supply and it would not be surprising to hear soon that the distributors are sold up for the year. Dribbling amounts are now coming through to Philadelphia and New York to fill the more pressing requisitions but no surplus is looked for until trade conditions are very much different. Fleet units belonging to the largest shippers are still loading Pocahontas and New River more or less regularly at Hampton Roads.

The Pennsylvania grades, particularly those in the central districts, are apparently on the edge of a flurry. A hitch in labor negotiations has caused some of the interests to withdraw options and at certain points it would take very little to start a small panic. The uncertainties of labor supply are enough to make operators very wary on commitments. The steam trade from New York and Philadelphia is certainly very much upset at this writing. Those with contracts already made are wondering whether they will be able to get the coal. In sympathy with the current situation prices have advanced 20@25c., even on the grades less favorably known; that is, f.o.b. mines in scattered instances for prompt shipment.

Anthracite—Shipments to New England continue to be very slow. Practically all the shippers are from 30 to 60 days behind on their orders. Milder weather is about the only encouraging sign to those dealers who have been down to bare boards much of the time since Jan. 1. Buyers are also waking up to the fact that there are now fewer sources of supply than formerly and even those with barges available have had their fleets somewhat reduced during the last two seasons.

It is evident too that unfavorable weather has a very direct effect on output at the mines through the irregular dumping at the loading piers. Thick northeasterly weather early this week has again interfered with the movement of boats. The Penobscot and Kennebec Rivers opened to navigation on Apr. 1, rather earlier than was expected and that only increases the pressing demand for domestic sizes. Broken and the buckwheats are in very short supply. The steam sizes are likely to meet with strong demand all season in this territory on account of the high price of bituminous.

Bituminous prices, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.65@3.20	$2.95@3.50	.....	$1.40@1.90
Cambrias and Somersets	2.85@3.35	3.15@3.65	.....	1.60@2.10
Georges Creek (contract)	3.07@3.17	3.37@3.47	$3.00@3.10	$2.00

Pocahontas and New River are quoted at $2.75@2.85 f.o.b. Norfolk and Newport News, Va., and on cars at Boston and Providence, $5.25@5.75.

NEW YORK

Anthracite demand quiet but steady. Production sufficient for present needs. Bituminous situation easy. Tidewater embargoes partly removed.

Anthracite—Mild weather and continuation of mine operations has resulted in a quiet market. There is a steady call for supplies but the demand is not urgent. Shippers are able to make deliveries without much trouble. The announcement that the mines would work after Apr. 1, notwithstanding the failure of the subcommittee to reach an agreement, had its effect upon dealers and orders are slower.

Nearly all the loading docks here are free of embargoes and some shippers claim that coal is being received faster than it can be loaded into bottoms. Shipments to points along the Sound are being rushed. Embargoes all-rail to New England remain unchanged and there are shippers who say that it will take 60 days to relieve the situation there after the embargoes are lifted.

Operations at the mines are not active and if the movement was free the present production would fall short of the demand.

Company's tidewater prices are held firm with an occasional cut of 10c. by individuals to unload. Demand for prepared coals is well balanced but the call for the steam sizes is not so insistent as last week. Pea coal is bringing company circular. The smaller coals continue active.

Current quotations, gross tons, f.o.b. tidewater, at the lower ports follow:

	Circular	Individual		Circular	Individual
Broken	$5.05	.....	Pea	$3.50	$3.50@3.50
Egg	5.30	$5.30@5.30	Buck	2.75	3.00@3.25
Stove	5.30	5.30@5.30	Rice	2.25	2.15@2.25
Nut	5.55	5.55@5.55	Barley	1.75	2.00@2.10

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates.

Bituminous—The bituminous market seems to have settled down to a summer basis. There is no great activity and production is light. Shipments from the docks in the New York harbor are plentiful and with a good supply on hand prices are not as strong. Loaded boats are not in such great demand.

Shipments to line points are slow, embargoes especially in New England making it almost impossible to get coal forward, to some points. Water transportation to New England and points along the Sound is better. Prices at the mines for shipment on the Eastern roads are easy because of the comparatively few points to which coal can be sent. The failure of the scale committee in Philadelphia to arrive at a new agreement for the Central Pennsylvania miners has had an effect upon the local market. Contracts are being closed with prices from 25 to 30c. above last year's rates. Some buyers continue to hold off expecting still lower prices than now prevail.

Labor supply continues to be a source of worry to the operators and cars are also scarce. Inquiries are numerous for export but bottoms are scarce and freight rates high.

Quotations for various coals, gross tons, f.o.b. tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.60@3.75	$3.60@3.75	$3.60@3.75	$2.15@2.20
Georges Creek Tyson	3.40@3.60	3.40@3.60	3.40@3.60	1.85@2.05
Clearfield: Medium	3.25@3.50	3.25@3.50	.....	1.70@1.95
South Forks	3.50@3.75	.....	.....	1.95@2.20
Nanty Glo	3.35@3.60	.....	.....	1.80@2.05
Somerset County: Medium	3.25@3.50	3.25@3.50	3.25@3.50	1.70@1.95
Quemahoning	.....	3.45@3.60	3.45@3.60	1.90@2.05
West Virginia Fairmont ¾	.....	3.00@3.10	3.00@3.10	1.25@1.35
Fairmont mine-run	.....	3.00@3.10	3.00@3.10	1.15@1.25
Western Maryland	.....	3.10@3.25	3.10@3.25	1.55@1.70

PHILADELPHIA

Anthracite orders slump badly but March prices continue. Short time at collieries likely. Cut prices develop few orders. Bituminous almost at a standstill and prices drop.

Anthracite—It appears as though many operators will soon have to close down on account of lack of orders. The dealers show little interest at the prevailing prices while the operators claim they do not know how long their mines will be in operation and even these quotations may be withdrawn at any time without notice. Conditions seem to indicate the strong possibility of trouble, but the dealers have large stocks and are seemingly indifferent. The general public, however, is getting uneasy and laying in extra supplies, particularly those who usually take advantage of the regular April reduction. If it were not for this business the retail men would be practically idle.

Reports became quite numerous this week that the individuals were offering large blocks of coal at a considerable reduction from the March circular. These seem to be made very quietly, as most dealers when pressed refused to divulge the source. Nevertheless this has ben verified in quite a number of instances and there can be no doubt that stove coal, for instance, has been offered at $3.90, or 20c. under the prevailing price while numerous offers are noted at $4. Probably the biggest cut has been on egg coal, which has been sold at reductions of 30@40c. per ton, while chestnut has been quoted at $4.10. But despite these low offers very few orders have been placed, as the dealers seem to believe that they will get the regular April prices in the course of a week or so. Pea coal has also been quoted at less than $2.55, though this was on inferior grades, as this size continues in very strong demand. The uncertain conditions in the bituminous market makes the steam sizes hold on wonderfully well, especially buckwheat. The concerns who had contracts for steam sizes which expired on Mar. 31 seem satisfied with the arrangement of continuing the contract price for such shipments as are made in April. Most of the industrial plants have large

reserve stocks and they will be able to withstand a suspension of several weeks should it come.

The embargo on tide coal at Port Richmond is being lifted occasionally and quite a good tonnage of coal is going forward to coastwise points especially New England.

Collections continue good, and the shippers have their outstanding accounts at the lowest ebb for some years. Much of this is due, however, to the large credits being made for the state tax.

The prices per gross ton, f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide, are as follows:

	Line	Tide		Line	Tide
Broken	$3.60	$4.85	Pea	$2.55	$3.30
Egg	3.85	5.10	Buckwheat	1.55	2.30
Stove	4.10	5.10	Rice	.90	1.80
Chestnut	4.25	5.35	Barley	.55	1.30

Bituminous—The present is a time of suspense. The consumer is not buying, the operator is not particularly anxious to take orders, not knowing how long he will have anything to sell, and the miners of the Central District seem to be equally uncertain about working. No progress has been made at the conference and most of the mining interests believe that the meeting will adjourn and that the mines will suspend. In spite of these conditions prices continue to fall, although the latest decline is not so violent. The biggest change was a shading of from 10@15c. on some of the Fairmont grades. A few of the other coals, principally the Pennsylvanias, declined only 5c. a ton, while the others remained stationary. The decline here is due entirely to the fact that this city is plentifully supplied with coal, as the embargoes against shipments out of this territory are only opened a few days at a time and not enough coal passes to materially relieve the congested situation. West Virginia shippers are badly handicapped by the car supply. The shippers are chafing under what they consider several instances of inequitable treatment and are threatening suits if they are compelled to pay demurrage.

The prices per gross ton, f.o.b. cars at mines, are about as follows:

Georges Creek Big Vein	$1.90@2.00	Fairmont gas, ¾	$1.50@1.60
South Fork Miller Vein	1.70@1.80	Fairmont gas, mine-run	1.35@1.45
Clearfield (ordinary)	1.50@1.60	Fairmont gas, slack	1.05@1.10
Somerset (ordinary)	1.35@1.45	Fairmont lump, ordinary	1.30@1.35
West Va. Freeport	1.30@1.35	Fairmont mine-run	1.15@1.25
		Fairmont slack	1.05@1.10

HAMPTON ROADS

Dumpings for week show up well. Total movement for March amounts to 1,393,859 tons. Virginian Ry. breaks previous records.

Dumpings for the last week of March were heavy, although the movement herein has not been quite so large as anticipated. There is a fair accumulation of coal at Tidewater, with considerable vessel tonnage overdue. The demand during the week has not been so heavy for spot cargoes, although there has been some few sales made. Prices are practically unchanged.

Dumpings over the three piers at Hampton Roads for March totaled 1,393,859 tons, of which the Norfolk & Western Ry. handled 626,880 tons, the Virginian Ry. 389,301 tons and the Chesapeake & Ohio Ry. 377,678 tons. The dumpings of the Virginian Ry. make a record month for that road by about 8,000 tons and places it in second place in the dumpings for the month. The Norfolk & Western Ry. has again failed to dump as much as the combined figures of the other two roads.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Mar. 4	Mar. 11	Mar. 18	Mar. 25	Apr. 1
Norfolk & Western	119,920	126,540	142,223	165,608	145,941
Chesapeake & Ohio	84,849	75,525	60 412	90,095	98,495
Virginian	66,912	68,598	104,810	103,055	.....
Totals	271,681	269,663	307,445	359,758	.....

BALTIMORE

Anthracite trade almost at a standstill. Bituminous business light. Exports decline due to vessel delays.

The fact that there will be no reduction in the anthracite circular here is the cause of the stagnation in the trade. Bituminous conditions are none of the best. The embargo to St. Georges was lifted part of last week, but there is still much congestion on the railroads, and considerable cheap coal offering for immedate line delivery. Contract prices hold firm, and the better grade steam coals, even on spot sales, are usually fairly steady.

Prices to the trade, mine basis, are as follows: Georges Creek Tyson, $1.65; Miller Vein, $1.40; Quemahoning, $1.40; Somerset, $1.30; Freeport, $1.15; Fairmont gas, three-quarter, 90c.; same, mine-run, 90c. and slack, 85@90c. Export trade took an unexpected drop the past week, due largely to failure of vessels to report as due. But one loading was recorded.

Ocean Charters and Freights

OCEAN FREIGHTS

The general freight market is as firm, if not firmer, than a week ago, but notwithstanding this the rates on coal to certain destinations are easier. To the Plate rates remained very firm until the end of last week, when they became perceptibly easier when it was reported that the British Government had requisitioned some steamers to load grain at the Plate, which boats will be required to make the outward voyage and may take coal.

The opening of the canal will cause a lessening demand for steamers to take coal to the Windward Island bunkering stations, which will undoubtedly assist in reducing these freights; the opening will also naturally reduce all outward freights to the west coast of South America.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$4.75@5.00	Bermuda	$5.00@6.00
Cardenas or Sagua	6.25 about	Vera Cruz	7.00@8.00
Cienfuegos	6 00@6.50	Tampico	7.00@8.00
Port au Spain, Trinidad	7.50 about	Rio Janeiro	[4]19.50@20.00
St. Lucia	7.50 about	Santos*	[4]19.50@20.00
St. Thomas	7.00 about	Montevideo	24.00[1] about
Barbados	7.50 about	BuenosAires or La Plata	24.00[4] about
Kingston	6.50 about	Rosario	26.40@27.60[2]
Curacao	7.00 about[3]	West Coast of Italy	31.20@33.60
Santiago	6.00@6.50[6]	Barcelona[5]	**27.60@30.00
Guantanamo	6.00@6.50[6]	Valparaiso or Callao	18.00@18.22
Demerara	.....	Marseilles	30.00@32.40

* Consignees paying dockage dues. ** Spanish dues for account of cargo.

[1]1,000 tons discharge, possibly 500 tons at 30c. [2]500 tons discharge. [3]And p.c. [4]Net, 1,000 tons discharge. [5]Or other good Spanish port. [6]300 tons discharge. W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge, 24c. per net register ton per day demurrage."

VESSEL CLEARANCES

The following steamers have cleared from various ports during the past week:

NORFOLK

Vessel	Destination	Tons
Achilles[1]	Cristobal	11,984
Musner[12]	Savona	
Skogstad[2]	Port of Spain	
Panama		
Tramp.[2]	Havana	7,290
Barrett	Buenos Aires	2,847
Negus[13]	Barbados*	
Guyaz[13]	Pernambuco	2,115
Atlantide[12]	Porto Ferrajo	7,500
Norden[2]	Havana	3,500
Gurupy[13]	Rio de Janeiro	1,807
Guildhall[11]	Cuba	1,800
M. Parsons[13]	Pernambuco	930
Guahkba[13]	Rio de Janeiro	2,059
Davenport[2]	San Juan	1,107
L. Urann[13]	Havana	2,161†
A. Soencer[12]	Mayanguez	554

NEWPORT NEWS

I. B. Ellems[4]	P. Plata
Flores[7]	La Plata

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Manzanillo[4]	Santiago	2,200
H. Tegner[11]	Santiago	
Brattingsborg[4]	R. Plate	4,200
Natuna[7]	Buenos Aires	
Harald[4]	Bridgetown	4,568
Lodaner[4]	Havana	5,350
Venus[14]		5,400
Nolisment[14]	Genoa	7,431

PHILADELPHIA

Nordboen[4]	Havana	1,547
R. Colorado	Rio Janeiro	
S. M. Seaman	Desalabra	953
Tallac	Puerto Mexico	1,103
Kinmount[4]	Santiago, Cuba	1,598
M. E. Harper	Havana	
H. T. Scott[4]	Havana	915
Wien	Antilla	
Fjell	Manzanilla	
D. Carter	Bahia, Brazil	

[1] Atwater & Co. [2] Baker Whiteley [3] Barber & Co. [4] Berwind-White [5] C. C. Blake Co. [6] Castner, Curran & Bullitt [7] Chesapeake & Ohio C. & C. Co. [8] Crozer-Pocahontas Co. [9] Hasler Brothers [10] Flat Top Fuel Co. [11] New River Coal Co. [12] Pocahontas Fuel Co. [13] Smokeless Fuel Co. [14] C. H. Sprague & Son [16] Va. Coaling Corp.

* And Guanoco. † And 410 tons of briquettes.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
H. T. Scott	Havana	915	
Kimmount	Santiago	1,598	
Augusta	Cay Francis	514	$5.25[4]
A. A. Raven	R. Janeiro	1,905	
Tallac[5]	P. Mexico	1,103	5.75

VIRGINIA

W. C. May[1]	Bahia	607	20.00
Bacchus	R. Plate	1,401[2]	24.60
S. Bebis[1]	R. Plate	2,216	24.60
J. Jones	R. Plate		20.00

VIRGINIA—Continued

Vessel	To	Tons	Rate
Palmer	R. Plate		$20.00
O. Monarch	B. Aires	2,945	24.60

BALTIMORE

Llanishen	Italy[3]	2,434	
Torne	Sweden	1,963	
Hilton	Tampa	2,324	
Llanishen	Italy	2,434	

[1] April. [2] Sublet. [3] West Coast. [4] And port charges. [5] Previously noted from Virginia.

COASTWISE FREIGHTS

While quotations are unchanged transportation is even harder to get than a week ago and when boats have made their present trips and are available for charter it is quite likely that freights will take another jump. Meanwhile $2.25 @2.50 is the asking range for tonnage from Hampton Roads to Boston and $2.15@2.25 for the same loading to Providence and similar ports.

Barge rates from New York to Long Island points have eased to a dollar flat but any temporary shortage of either boats or coal will send them up again.

LAKE MARKETS

PITTSBURGH

Market uneventful. Cars in better supply. Efforts to maintain organizations. Prices unchanged.

The first week in April proves decidedly uneventful in comparison with the expectations that were entertained two or three months ago. While the wage scales are not all in final shape the mines as a rule are able to operate and there is scarcely any idleness from this cause. Car supplies have been somewhat better the past few days and on the whole transportation difficulties have caused much less inconvenience than for several months past. Labor is rather scarce and operators are making every effort to hold their organizations together, with the result that more coal is offered on the market from day to day than would be the case if a plentiful labor supply were assured. Practice and theory are somewhat at variance in this instance, as scarcity of labor is not operating to make the market stiff, though in the future the case is likely to be altogether different.

There will be no early opening of the Lake navigation season. Reports as to ice conditions on the lakes have been disappointing and there is not likely to be much movement until the last week or ten days of the month.

Contracting for the twelvemonth continues in rather desultory fashion. We quote prices on prompt coal unchanged: Slack, $1.10@1.15; mine-run, $1.15@1.25; ¾-in., $1.25@1.40; 1¼-in., $1.35@1.50, per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous weak on account of mining difficulties. Anthracite not selling till prices are regulated. Car situation not much improved. No coal on track.

Bituminous—The consumer is not urgent to buy unless he can get a favorable contract, and the seller is not willing to guess on future prices; there is nothing like a steady-going price anywhere. There is quite an amount of coal still coming his way from the Southwest that sells at 50c. or more below either Pittsburgh or Allegheny Valley coals. It may happen that the Lake trade will take up this coal, but that will not be known until shipments begin; loading has already begun, but the Lake opening may be late.

Leading Pittsburgh shippers have announced a continuation of former prices made to the Buffalo trade, from Apr. 1 indefinitely, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.95	$2.75	$2.80
Three-quarter	2.85	2.60	.....
Mine run	2.75	2.50	2.60
Slack	2.40	2.30	2.60

Prices are per net ton, f.o.b., except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—The demand is next to nothing so far as the consumer is concerned, though the rail lines are somewhat active. The season is over and as there is no reduction of price for April the jobbers are mostly holding up orders. Everything is so uncertain that business is confined to coal for immediate consumption. Even the independent companies do not seem to know what to do, with no fixed prices to adhere to.

The supply in general has been light for some time, though three of the regular Lake shippers are putting coal into vessels. The Lake opening date cannot be foretold and may be some weeks away. Two shippers have loaded six cargoes each, a total of about 100,000 tons, and the season may be said to be open so far as dock activities are concerned.

TORONTO, CAN.

Warmer weather decreases sales of anthracite. Bituminous in fair demand with prices steady. Transportation conditions show improvement.

With the setting in of mild spring weather the demand for anthracite has fallen off considerably. Bituminous finds a steady market as manufacturing is active in nearly all lines, but many large consumers are beginning to use up the supplies accumulated against a possible shortage. Prices are firm and a general feeling of uncertainty as to the future prevails among the dealers, pending a settlement of the wage scale. Transportation has improved and there are good supplies on hand. Quotations for best grades per short ton are: Retail, anthracite egg, stove and nut, $8; grate, $7.75; pea, $6.75; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, $3.75; screenings, $3.50; Pennsylvania smokeless lump, $4.50; Pocahontas lump, $5.50; slack, $3.75.

COLUMBUS

General cleaning up preparatory to a short suspension pending a settlement of working conditions. Steam trade good, but domestic demand light.

The Hocking Valley and other operators closed down Apr. 1, pending the adjustment of working conditions, and outside of a few small coöperative mines, none is working. Steam users foreseeing this condition bought rather liberally for shipment during the first half of April. Demand on the part of steam consumers has been good, as manufacturing is still expanding.

Lake trade is now attracting considerable attention and preparations have been made for an active season. Chartering of boats is difficult because of the scarcity of bottoms and the opening of navigation promises to be late because of the large amount of ice. Practically all of the steam sizes on the docks have been exhausted and a good tonnage will be moved as soon as possible.

Anthracite demand is good for the time of the year, as quite a few consumers are laying in their next season's supply because of the likelihood of a strike.

	Hocking	Pomeroy	East Ohio		Hocking	Pomeroy	East Ohio
Re-screened lump	$1.50	$1.60	.....	Mine-run	$1.15	$1.20	$1.15
Inch and a quarter	1.40	1.40	$1.40	Nut, pea and slack	.85	.85	.80
Three-quarter-inch	1.35	1.35	1.30	Coarse slack	.75	.75	.70
Nut	1.25	1.25	.....				

DETROIT

Light sales of steam and domestic coal. Anthracite sluggish. Opening of Lake season delayed.

Bituminous—With industrial activity showing no diminution, the buying of steam coal proceeds on a restricted scale due, in part, to the heavy buying in expectation of a suspension on Apr. 1. Even less interest is shown by retail yards and consumers.

Anthracite—Shippers are still experiencing delay in getting anthracite, due to embargoes. Few of the retail yards are showing any anxiety to renew their stocks.

Lake Trade—Unusually heavy ice blocks most of the upper Lake ports and the passages through the St. Mary's River and the Straits of Mackinac. Little coal will be moved before Apr. 15 under the present outlook. Shippers find vessel owners unwilling to close freight contracts. It is reported negotiations are under way to contract for movement of a large tonnage, which will be distributed through several years.

CINCINNATI

Limited demand for domestic grades and poor car supply hold up nut and slack. Contracting progressing satisfactorily.

The continued strength of nut and slack is still the principal feature of the local market; at this time, however, it seems to be due more to an inadequate supply. The contracting season is fairly satisfactory, in spite of higher prices, though buyers are slow to close up contracts, many indicating a belief that they will be able to do better later on. The beginning of the Lake movement is expected to stimulate the whole market materially, which should mean higher prices all around.

COKE

CONNELLSVILLE

Active contracting movement in foundry coke at $3.50. Spot furnace coke lower.

Contracting for foundry coke has been very active, although shipments on the contracts are not to begin until July. The movement as a whole is nearly three months in advance of the usual time, foundries being desirous of playing safe while operators are naming a price that seems fairly reasonable in the circumstances, $3.50 being the established level. Sellers are quoting the same price for six months as for 12 months, some buyers choosing the longer period and some the shorter. There are occasional negotiations for furnace coke on contract but on the whole this branch of the market is decidedly neglected.

Spot furnace coke has taken quite a tumble in the past few days. The better car supply of the past ten days has resulted in heavy shipments on contract and some furnaces are asking for a curtailment, while scarcely any have been in the market for spot coke. For several days past it has been easy to obtain spot coke at $3, and this price could be shaded on some brands. We note one sale of 40 cars last Friday, however, at $3.25. Struthers furnace, which has been taking 15,000 tons, has had an accident and went out of blast so suddenly that the stack must be shoveled out. It was the intention to blow out the furnace about May 1. The coke released may make the market still easier. We quote: Spot furnace, $2.75@

3; contract furnace, $2.50@3; spot foundry, $3.75; contract foundry, $3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Mar. 25 at 459,468 tons, an increase of 26,779 tons, and shipments at 456,337 tons, an increase of 26,569 tons.

Buffalo—The trade is not very active, but prices are fairly strong and will remain so as long as the car shortage keeps the production down. At one time it looked as though the over-production would injure the trade badly, but there is no improvement in the car situation. The demand for iron is good and manufacturers are now taking orders for 1917 delivery. Coke prices remain at $6 for best 72-hr. Connellsvill foundry and $4.85 for 48-hr. furnace.

Chicago—A heavy volume of trade in coke continues, and top prices are still being realized. Spot shipments of foundry and furnace sizes in some cases command a premium. Some large companies have informed the retail trade that prices will be 25c. over the 1915-1916 basis. This will start the spot April prices at $4.50 Chicago instead of $4.25, and it is generally felt that new prices will be from 25c. to 50c. per ton over the present schedule. Quotations per net ton f.o.b. cars Chicago are as follows: Connellsville, $6.50; Wise County, $6.25 to $6.50; Byproduct Foundry, $6.50; Byproduct Domestic, $4.50; Gas House, $4.50 to $4.60.

MIDDLE WESTERN

GENERAL REVIEW

Dullness prevails but prices are not unduly depressed. Contracting active. Screenings firm.

The spot market on all sizes except screenings is sluggish. The demand for coarse steam coals is weak now that many of the large consumers are using storage fuel. A large number of mines in Indiana and Illinois closed down on Apr. 1, and it is predicted that most of them will remain idle for two or three months to come.

It is said that a considerable amount of Lake tonnage has been closed at prices ranging from 10c. to 25c. per ton over last year's basis. Vessel rates to the head of the Lakes will average 5c. per ton higher than last year. The docks are short of coal, and will undoubtedly absorb a large tonnage as soon as navigation is opened.

Notwithstanding the general dullness prevailing, there is but little change in prices, except occasionally where consignment coal has to be sacrificed to avoid demurrage. Contracting has been slow owing to the unsettled wage negotiations. In several districts in Indiana and Illinois trouble has not been entirely averted, and shippers are unwilling to make prices until the wage scale is definitely fixed. Nobody seems to be satisfied with the wage settlement made in New York, and this situation is bound to cause delay in making local district scales.

Anthracite shippers have advised the trade that circular prices will not be reduced on Apr. 1 according to past custom. Eastern coals, particularly smokeless, have been very slow, but some contracts have been concluded at $1.35 on mine-run and $1.60 on lump and egg, these being the new circular prices.

CHICAGO

Light movement of coal to Chicago district. New April prices announced. Screenings firm with strong demand.

Franklin and Williamson County domestic lump is very slow, with egg and nut much in the same position. The demand for steam sizes is steady with no change in prices. Screenings from Southern Illinois are being shipped out from the mines as fast as produced, the prices averaging from 90c. to $1 per ton. Owing to slackening up of trade, the mines have averaged about two days running time this week, and accumulated unbilled coal is piling up rapidly. Franklin County new circular prices of $1.45 on lump, egg and No. 1 nut, $1.35 on No. 2 nut, and $1.30 on special chestnut were announced to take effect for April shipment. The Williamson County operators have announced the following prices for April: Lump and egg, $1.45; No. 1 washed nut, $1.50 and No. 2 washed nut $1.40. All the mines have been closing contracts at satisfactory prices, and the outlook is promising.

Operators and jobbers are making contracts for next year on a basis averaging 10c. higher than those which have prevailed this year for Indiana sizes. Prices on spot shipments have not changed during the past week. The demand for steam grades is weak, coal from storage piles now being used. April prices on Clinton domestic coal call for $1.50; egg, $1.50, and nut, $1.40. But little coal is expected to be purchased from Indiana mines during the month of April. Screenings are very strong at 95c.

New circular prices of $1.35 on smokeless mine-run and $1.60 on smokeless lump and egg are in effect, and a number of contracts are reported to have been made at these figures. Very little smokeless coal has been sold, and some spot egg has been sacrificed to avoid demurrage. Shipments of Pennsylvania smokeless to this market have been of little consequence.

Quotations in the Chicago market are as follows per net ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos
Lump	$1.45	$1.50	$1.50	$1.50	$1.50
Steam lump	....	1.25@1.35	....	1.25@1.35	1.35
2½ and 3-in. lump	....	....	1.35@1.40	....	....
1¼-in. lump.	1.30@1.35	....	1.25@1.35	1.25@1.35	1.35@1.40
Egg	1.45	1.25	1.35	1.50	1.35@1.50
Nut	1.35@1.45	1.25	1.25@1.35	1.40	1.25
No.1washed	1.50	....	1.50	....	....
No.2washed	1.40	....	1.40	....	....
No. 1 nut	1.45	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.15@1.25	1.15@1.25	1.00@1.15	1.10@1.15	1.10@1.20
Screenings	.90@1.00	.90@ .95	.85@ .90	.90@ .95	.90

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.45	$1.25@2.40	$1.60	$1.60	$1.50@1.60
1¼-in. lump.	1.30	....	....	....	1.40@1.50
Egg	1.45	1.25@2.00	1.60	1.60	1.10@1.25
Nut	1.35@1.45	1.10@1.70	1.40	1.40	....
No. 1 nut	1.45	....	....	....	....
No. 2 nut	1.35	....	....	....	....
Mine-run	1.25	1.00@1.25	1.35	1.35	1.10@1.20
Screenings	.90@1.00	.85@ .95	....	.....	....

ST. LOUIS

Industrial consumption the only active feature of the market. Screenings improve with an advance in prices.

Aside from the industrial and railroad concerns which stored no coal, there is little steam coal moving in any direction. Domestic demand is negligible excepting for No. 1 nut which is moving in better than other coarse sizes. Screenings are more active with 5 to 10c. per ton added to the previous week's offerings. Many mines are operating to better capacity at the moment in order to accumulate some tonnage in anticipation of closing during the early days of this month.

The following prices are being quoted on Southern Illinois coal for April sales: No. 2 washed nut, $1.35; No. 3 washed nut, $1.30; No. 4 washed pea, $1.25; No. 5 washed slack, 85c.; 3-in. screenings, $1.10; 2-in. screenings, 90c.; 1½-in. screenings, 85c.; mine-run, $1.20; steam lump and egg, $1.45; 6-in. and 3-in. lump, 6x3-in. egg, No. 1 raw nut, $1.45; No. 1 washed nut, $1.50.

New contracts are being made at from 5 to 10c. per ton above last year's figures. Many have been closed during the past week or two. No anthracite prices have as yet been given out.

Following is the range of prices, per net ton, f.o.b. cars at mines:

	Williamson and Franklin	Staunton and Mt. Olive	Montgomery Co.	Intermediate	Standard
8-in. lump	.....	.....	.....	$1.10@1.35	$1.05@1.20
6-in. lump	$1.25@1.75	$1.25@1.50	$1.15@1.30	1.10@1.35	1.05@1.20
3-in. lump	1.25@1.75	1.25@1.50	.....	1.10@1.35	.....
2-in. lump	1.20@1.30	1.10@1.25	.....	1.10@1.20	.80@ .90
1¼-in. lump.	1.20@1.30	1.10@1.25	1.10@1.20	1.10@1.20	.80@ .90
6x3-in. egg	1.25@1.75	.....	1.15@1.30	1.10@1.35	1.05@1.20
6x2-in. egg	.....	.....	1.10@1.20	1.10@1.20	.80@ .90
6x1¼-in. egg	1.20@1.30	.....	1.10@1.20	1.10@1.20	.80@ .90
No. 1 nut	1.20@1.50	.....	1.15@1.30	1.05@1.25	.85@ .95
No. 2 nut	1.15@1.35	.90@1.10	.....	.90@1.10	.80@ .90
Mine run	1.05@1.15	1.05@1.15	1.05@1.15	1.05@1.10	.80@ .95
Screenings	.85@1.00	.80@ .90	.80@ .90	.75@ .80	.75@ .80
Washed:					
No. 1 nut	1.50@1.75	1.40@1.60	.....	1.40@1.60	1.35@1.50
No. 2 nut	1.25@1.50	1.25@1.40	.....	1.25@1.40	1.25@1.40
No. 3 nut	1.25@1.50	1.25@1.40	.....	1.20@1.30	1.20@1.30
No. 4 pea	1.20@1.40	1.20@1.35	.....	1.20@1.35	1.20@1.35
No. 4 slack	.85@1.00	.80@ .90	.....	.75@ .90	.75@ .90

FOREIGN MARKETS

GREAT BRITAIN

Mar. 22—Conditions in the steam coal trade, while not very active, show rather a stronger tendency. Tonnage is arriving a little more freely. Quotations are approximately as follows:

Best Welsh steam	Nominal	Best Monmouthshires	$7.56@7.68
Best seconds	Nominal	Seconds	7.32@7.56
Seconds	$7.56@7.80	Best Cardiff smalls	4.08@4.32
Best dry coals	7.68@7.92	Cargo smalls	2.64@3.36

Freight—Tonnage is still exceedingly scarce and rates show a further advance all around and are approximately as follows:

Gibraltar	$13.80	Naples	$22.80	St. Vincent	$11.40
Marseilles	24.12	Alexandria	24.60	River Plate	18.00
Algiers	21.23	Port Said	24.00		
Genoa	23.40	Las Palmas	10.80		

Financial Department

U. S. Steel Corporation

The United States Steel Corporation during the year ended Dec. 31, 1915, mined 20,800,204 tons of coal for use in the manufacture of coke as against 15,890,382 tons in 1914, and 5,828,278 tons for steam, gas and all other purposes, as compared with 5,271,911 tons in 1914. There were 14,500,818 tons of coke manufactured as compared with 11,173,914 tons in 1914.

The corporation purchased during the year 142 acres of coking coal and 21 acres of surface in the Connellsville district, and at the Farrell byproduct coke operation of the Sharon Coke Co. the plant for the recovery of benzol was completed and 10 tank cars for transportation of the product purchased.

There are on the payrolls of the corporation 191,126 employees of which 19,485 are attached to its coal and coke properties. In 1914 its coal and coke employees numbered 16,155. The average salary or wage per employee per day, exclusive of general administrative and selling force was $2.92 as compared with $2.88 in the previous year, and the average salary or wage per employee per day, including general administrative and selling force was $3.01 as against $2.97 in 1914.

The Northern coal and coke property consists of 131,459 acres of coking coal; 96,618 acres of steam coal and 24,879 acres of surface. It has 72 coke plants, 22,153 beehive ovens and 1,261 byproduct ovens. There are 28 coal plants not connected with coke plants.

The Southern coal and coke property (Tennessee Coal, Iron and Railroad Co.) consists of 178,734 acres of mineral interests and surface; 138,304 acres of mineral interests only, and 9,692 acres of surface. There are located on developed sections of this property 9 coal mining plants comprising 23 operating mines; 11 coal washing plants and 7 coking plants, the latter comprising a total of 2,974 beehive coke ovens. There is also one byproduct coke plant consisting of 280 ovens at Fairfield which is operated with the blast furnace at the Ensley Works.

There are located in the Connellsville coke region 13 reservoirs and 6 pumping stations with a distributing system of pipe lines aggregating 92 miles in length. These plants have a daily capacity of 18,000,000 gallons, furnishing water for use in manufacturing coke and in addition supplying water to 3 municipalities.

On Feb. 1, 1916, an advance was made in the wages and salaries of the subsidiary companies of the corporation. This increase averaged approximately 10% and on the basis of an annual pay roll equal in numbers to that for 1915, these advances will call for an increased disbursement of approximately $14,000,000 per annum.

Delaware, Lackawanna & Western

President Wm. H. Truesdale reports, in part, for the year ended Dec. 31, 1915, as follows:

Coal Mining Department—The tonnage produced from our collieries and washeries aggregated 8,765,247 tons, a decrease of 284,830 tons from 1914, chiefly due to unusual weather conditions early in the year. The reduction in earnings of the department, amounting to $818,645, was due in part to the reduced tonnage produced and in part to the readjustment of the contract between this company and the D., L. & W. Coal Co., which was necessitated by a decision of the courts. Important development work has been successfully prosecuted and is now nearing completion. Extraordinary expenditures aggregated $621,376. Of this sum $383,027 was for the development of the new Loomis colliery, which will be placed in operation early in 1916. In the development of the new Laurel Run property, connected with the Pettebone colliery, there was expended $103,487; this work will also be completed early in 1916. These two new operations will increase substantially the company's production of coal.

A considerable expenditure was made for the purchase of coal cutting machines and appurtenances for use in mining the coal in a number of our older collieries, in which the unmined coal is in the thin veins or the pillars, and requires the use of coal-cutting machinery. Notwithstanding this equipment, the labor cost of mining coal during the past year was higher than in any previous one, and this progressive increase in cost from year to year is the most serious problem that the anthracite industry has to face.

On Mar. 31, 1916 the agreement made with the anthracite mine employees in 1912 will expire by limitation and a new agreement will have to be negotiated.

The provisions of the Pennsylvania Workmen's Compensation Act, effective January, 1916, will place an added burden upon the operating companies.

Income Account—Notwithstanding the large increase in income from transportation, the net income was about $1,000,000 less than in 1914. This was due to several causes, the principal ones being as follows: (a) Falling off of $259,910 in hire of equipment account, practically all due to the accumulation of cars of other railways late in the year at New York awaiting ocean tonnage. (b) Decrease of $611,342 in the amount credited account of dividend income, due to extraordinary receipts in 1914 in connection with the sale of the Temple Iron Co. properties. (c) The reduction of $185,932 in income from funded securities, caused by the sale of treasury bonds. (d) Decrease of $913,967 in coal department operations, etc.

General Remarks—Without doubt, so long as the European War continues, the demands upon this country will result in a continuance of the existing high tide of business and general prosperity. Should the war cease suddenly, without doubt the business of the railways will also drop off very quickly.

RESULTS FOR YEARS ENDING DEC. 31

	New Basis		Old Basis	
	1915	1914	1914	1913
Coal	$13,364,007	$14,056,674	$14,040,574	$14,418,507
Merchandise fr'ght	18,742,617	15,673,086	14,448,308	15,089,057
Passengers	8,218,316	8,541,316	8,158,458	8,549,346
Mail, express and miscellaneous	3,737,847	3,550,714	2,602,450	2,727,238
Incidental	723,944	724,188		
Total	$44,786,731	$42,545,978	$39,249,790	$40,784,148
Maint. of way, etc.	$4,662,311	$5,161,625	$5,074,501	$5,148,035
Maint. of equipment	6,869,900	6,837,926	6,318,720	6,189,093
Traffic expenses	920,556	844,998	837,384	887,576
Transportation expenses	14,222,297	13,854,626	12,423,183	12,533,965
General	942,000	889,073	878,346	815,173
Misc. operations	350,505	383,029	.....	.....
Transp. for invest.	Cr.210,621	Cr.114,252	Cr.114,252	.....
Total	$27,756,947	$27,857,024	$25,417,882	$25,573,842
Net revenue	$17,029,784	$14,688,954	$13,831,908	$15,210,306
Net revenue outside oper.	.....	.....	350,842	511,800
Total net rev.	$17,029,784	$14,688,954	$14,182,750	$15,722,106
Taxes, etc.	2,116,839	2,097,039	2,060,832	1,980,000
Net, after taxes	$14,912,945	$12,591,915	$12,121,918	$13,742,106

Note—For previous annual report of this company see Vol. 8, p. 830.

Intercolonial Coal Co.

The annual statement of the Intercolonial Coal Co. the mines of which are at Westville, N. S. shows profits for 1915 of $46,558, against $54,176 in 1914. After paying interest and depreciation $10,593 was carried forward to profit and loss account, including the balance from the previous year. The output of coal was 177,977 tons against 213,289 tons in 1914. During the first part of the year business was poor, but materially improved during the later months.

Results for the past two years compare as follows:

	1915	1914
Profits	$46,556	$54,176
Less—		
Sinking fund	$5,250	$3,000
Bond interest	17,860	11,900
Discount deb.	1,546	128
Total charges	$24,656	$15,028
Balance	21,900	39,148
Previous balance	47,552	8,404
Surplus	$69,452	$47,552
Depreciation	58,858	.....
Profit and loss	$10,593	$47,552